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Index to Volume XXXI, July-December, 1924

Scope of This Index

This Index is divided into three sections—Subjects, Places and Authors. Under each heading in the three sections the order of listing is by sequence of publication.

In the notices of publications (pp. 69, 167, 275, 403, 507, 617) readers are directed to other sources of information on the various subjects dealt with in THE AMERICAN CITY. Other valuable information is contained in THE MUNICIPAL INDEX, which is described on the last page of this Index.

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For Additional Information

on the subjects listed in the foregoing pages and on other subjects relating to municipal improvements and civic advance, see THE AMERICAN CITY'S yearbook, *The Municipal Index*, a reference work of great practical value to municipal officials, civic organizations, educators, public libraries, and others having to do with municipal and county improvements.

The 1924 Edition is a bound volume of 408 pages of authentic articles on current practice and attainable standards, important statistics, bibliographies, alphabetical and classified lists, abridged catalogs, references to, and sources of, additional information and aid; all grouped into seventeen main divisions, as follows:

Administration—Government—Finance; City and Regional Planning, Housing and Zoning; Fire and Police Departments; Garbage, Ashes and Rubbish—Collection and Disposal; Motor Trucks in Municipal Departments; Parks—Playgrounds—Trees; Power-Plant Equipment and Operation; Public Health—Public Welfare—Public Education—Public and Community Buildings; Public Utility Ownership and Regulation; Sewers, Sewerage and Sewage Disposal; Street and Highway Lighting; Street Cleaning and Snow Removal; Street Construction; Traffic Control and Facilitation; Water-Supply and Purification; Municipal Aids from Uncle Sam; National Organizations Serving Municipalities.

The seventeen sections of the 1924 edition contain more than 148,000 words of text matter, exclusive of 261 pages of abridged catalogs. There are also more than 9,500 words descriptive of the activities and services of 114 national organizations and 25 Government bureaus serving municipalities. The bibliographies contain more than 1,100 entries; the alphabetical list of subjects, 675 entries; and the classified list of products and services, 943 entries under 375 headings. Price $4.00.

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A Good Time to Speed Municipal Work

FOUR factors combine to make the present summer an exceptionally good time in which to finance and contract for needed public improvements:

1. The wide-spread slackening in certain lines of business activity has resulted in added competition among manufacturers and contractors which, in many cases, will make possible the letting of contracts for municipal improvements at lower prices than have prevailed in recent months.

2. The condition of the money market is such as to enable municipalities to sell their bonds at exceptionally low interest rates. A tabulation of special interest in this connection appears on page 65.

3. Reduction of unemployment and a return to nation-wide prosperity can be stimulated by the speeding up of needed public works. It will be remembered that the President's Conference on Unemployment in 1921 recommended slowing up public works in good times and expanding them in bad times as a reserve against unemployment. Says Otto T. Mallery, a member of this conference:

> "The aggregate public works of towns is vastly more important than that of the Federal Government. It amounts to an average of over a billion dollars a year, as represented by bond issues alone, without including work paid for out of ordinary annual taxation.
>
> "Before this wise measure—long-range advance planning of public works—for stabilizing national business and employment can be carried out, the city official must do his thinking independently of his business associates and must insulate himself against their enthusiasm and their pessimism. He must act boldly as a public man, not as a private citizen. He must have the vision to build when the business man is not building and to slow down when the business man is in high gear. In every town there are citizens who advocate this policy and who will back him up in planning several years ahead in order to sell more bonds and do more work in years of unemployment."

4. It should no longer be assumed, even in our northern cities, that there must be a virtual abandonment of construction work in winter. Contracts let this summer and fall may in many cases be carried to completion during the winter months to the benefit of all concerned. The following paragraphs are from a report made May 1, 1924, by the American Association for Labor Legislation to the International Association on Unemployment:

> "At a winter construction meeting of the New York Building Congress, held in November, prominent constructors testified that it is not only practicable to spread building operations over the enire year, but also economical.
>
> "An important contribution to the movement toward regularizing the building industry has just been made by the President's Conference on Unemployment, under the direction of Secretary of Commerce Hoover. Following comprehensive investigation by a special committee . . . the Conference is about to issue a report on 'Seasonal Construction: The Facts and the Remedies.'
>
> "In carrying on its investigations the committee had in mind Secretary Hoover's statement that the construction industries are 'the balance wheel of American industry.' It recognized that activity in construction bears a close relation to general industrial conditions and that, if building falls off, there is bound to be slackening in many other lines of industry, particularly those supplying materials to the building trades, resulting in unemployment, decreased purchasing power of employees and further depression. It found that custom, not climate, is mainly responsible for seasonal idleness in the construction industries, and that the art of construction has advanced to such a point that the effect of bad weather on building operations has been greatly reduced. The committee also gave particular attention to the need for the adoption of a program of long-range planning of public works."

These four factors all point to the wisdom of reviving interest in municipal and county projects which have been postponed because of high prices or labor shortage, and of making a thorough survey of other needed improvements which may be wisely started during the remaining months of 1924. And the time to plan and act is now!

Different Levels for Foot, Wheel and Rail

By Harvey Wiley Corbett

Architect

As an outdoor sport, solving the traffic problem is becoming more popular than golf—and one of the easiest things to do about the traffic problem is to blame it all on the automobile. The automobile can't talk back; but it unfortunately comes back, until it seems as if one must literally climb the sides of the houses to get out of the way.

If pedestrians were the only annoyance the motorist has, the problem would be easy. Elimination of the pedestrians by the simple though somewhat barbaric process of killing them off, is rapidly solving that difficulty. The real trouble comes in getting the necessary increased street capacity for the motor hearses!

Some people offer the suggestion that we cut more streets. That is always a good idea. Why not keep on cutting more streets until there is no longer any room left for buildings? Surely as the proportion of street area to building area increases, the traffic problem decreases. If we could only maintain the proper relation, then our troubles would be over. Had New York remained a four-story city, there would be a much smaller traffic problem to-day. The original relation of street to building was ample. In the gridiron section as now laid out there is one acre of street area for every two acres of building area.

But New York is becoming a twenty-story city instead of a four-story city, while the streets remain the same. Can we cut new ones? Yes—but it's a long, slow and expensive job, while building goes right on every minute. Can we stop building? Yes—but we should have to revolutionize our whole conception of property ownership and realty values. Finally, can we persuade the people not to come to the city, but stay out in the country where the air is so fresh? Yes—but we should have to chain them to the trees!

But something must be done. We can't stop people from coming to the city, we can't stop building for them, we can't cut new streets. Why not try increasing the capacity of existing streets?

Editorial Note

Although directly applicable to the congested sections only of our very largest cities, the accompanying proposals by Mr. Corbett will be, we are sure, of interest to our readers in the smaller cities as well.

It may be that, by the next time a national political convention meets in New York, the visitor from Hometown will see this dream of a metropolitan architect on its way to materialization. But meanwhile the dream will have had a by-product of great value, if it shall serve as a warning to the citizens and officials of a thousand Hometowns so to plan and control local development that in their respective cities the almost unthinkably expensive methods for traffic relief herein proposed shall never be necessary.

Avoiding "Capital Operations"

Widening existing streets or cutting new ones is always a "capital operation," because to be of any real value the widening or cutting has to extend for long distances and involves an endless number of individual property owners.

To retain existing property lines, in principle, even though the city increases the restriction over what may be done within those lines, is always simpler than any attempt to change those lines.

The city must grow, the streets must be increased in capacity; and since they can't be widened or increased in numbers, *some form of double-decking must be used.*

The double-decking of streets is not a new idea. Leonardo da Vinci proposed it in a scheme to replan Milan. Most European cities have portions which are at differing levels, and have one or another form of double-decking. Chicago has an important boulevard which is double-decked for a considerable distance.

But before proposing a system of double-decking in the streets of New York, it would seem only proper that a very careful study be made of traffic to determine if there is not a rational division or separation in the various forms of traffic, which could become the basis of determining the form and character of the double-decking.

A careful analysis of traffic in all its forms leads one to the inevitable conclusion that it is of three different and distinct types, namely:

Foot.—All forms of pedestrian traffic
Wheel.—All forms of vehicular traffic
Rail.—All forms of train or car, running on fixed rails

(The horse is eliminated from consideration in the city.)

A further conclusion is that, in the congested centers of the city at least, these three forms of traffic do not belong on the same level.

It has been accepted as axiomatic that the "grade crossing" between roadway and railroad is a serious menace. Rail and wheel do not belong on the same level at the same point. Why should not this principle apply to wheel and foot traffic?

We find, in studying these three forms of traffic, that rail is the heaviest in weight, wheel next, and foot, of course, the lightest. Furthermore, of the three forms, wheel has increased beyond the bounds of all imagination, and is continuing to increase at a rate no one would attempt to prophesy.

On the other hand, rail traffic as a freight carrier (within the city) is certainly becoming less and less important, and as a passenger carrier (except in subways) is beginning to give place to wheel.

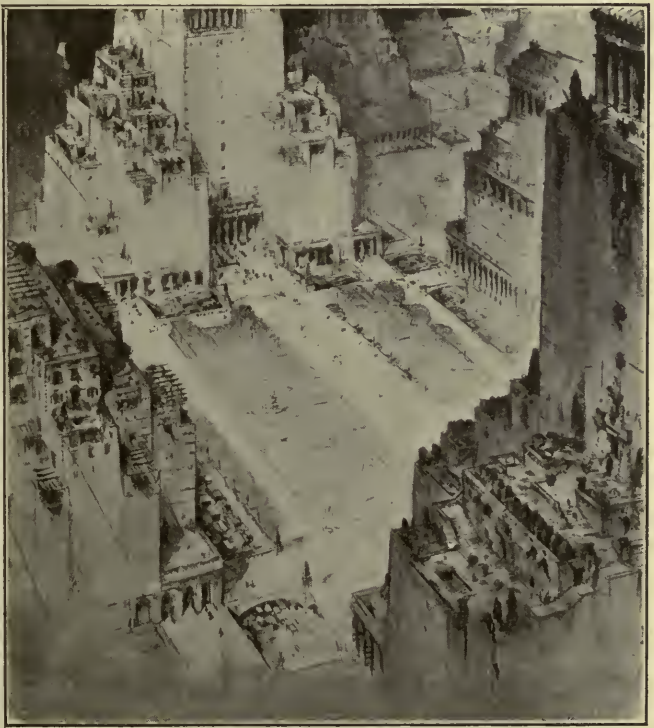
It seems rational, therefore, in any scheme proposing to divide traffic into its three natural divisions through a process of double- or triple-decking the streets, that we start by placing the wheel traffic, the largest and the most rapidly growing one, on the present street level—which is already there, and neither requires to be dug out or built up; that all rail traffic be placed underground, as subways; and that foot traffic be raised one story above the street level, carrying bridges across at all corners, and at one or two points in the long blocks as well, so that people can move uninterruptedly throughout as large a district as is covered by the expansion of the double-decking idea.

We concede the almost insurmountable difficulties of our problem and the very radical nature of the suggested solution, yet we believe such a solution can be brought about by a very gradual process which will make it possible of realization.

A Glance at the Future City

Before outlining in more detail this process of traffic division and the steps one would take in accomplishing the desired result, let us look for a moment at the future city. Let us assume that the steps have been taken, and let us see if the desired result is worth the effort we all realize must be made to achieve it.

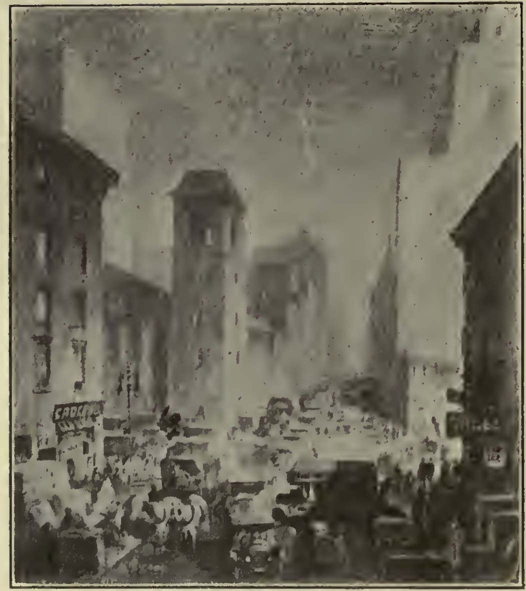
We see a city with sidewalks, arcaded *within the building lines,* and one story above the present street grade. We see bridges at all corners, the width of the arcades, and with solid railings. We see the smaller parks of the city (of which we trust there will be many more than at present) raised to this same sidewalk-arcade level, public parking space for autos being provided underneath. The whole aspect becomes that of a very modernized Venice, a city of arcades, piazzas and bridges, with canals for streets, only the canals will be filled not with water but with freely flowing motor traffic, the sun glittering on the



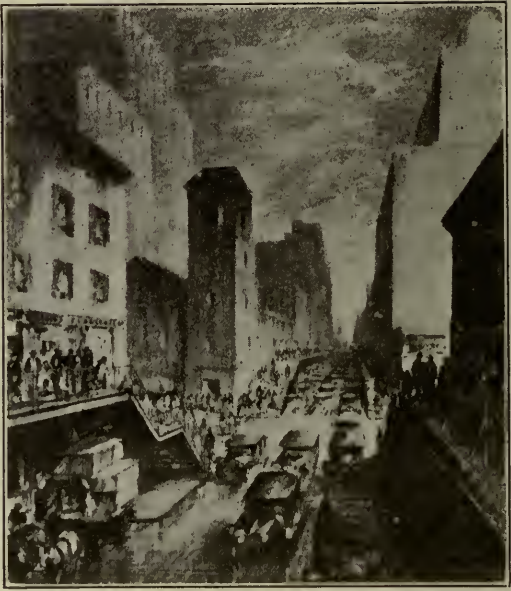
Drawn by Hugh Ferriss.—Copyright, The New York Times

AN IMAGINARY VIEW OF THE FUTURE CITY OF NEW YORK

This sketch illustrates possible future developments of the present New York zoning law. The setbacks required by law will, in the case of tall apartment houses, become terraces susceptible of various individual treatments. The sketch also suggests the proposal that separate levels be made for pedestrian and vehicular traffic



PRESENT CONDITION—THE STREET AS IT IS TO-DAY, WITH FOOT, WHEEL AND RAIL TRAFFIC OCCUPYING THE SAME LEVEL



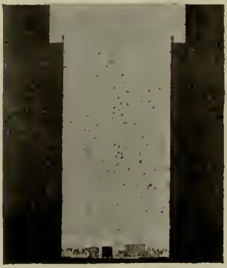
STEP NO. 1—SIDEWALK ELEVATED, WITH FULL WIDTH OF OLD ROADWAY AND SIDEWALKS AVAILABLE FOR WHEEL TRAFFIC

black tops of the cars, and the buildings reflecting in this waving flood of rapidly rolling vehicles.

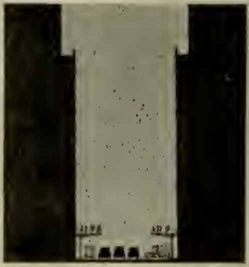
From an architectural view-point, and in regard to form, decoration, and proportion, the idea presents all the loveliness, and more, of Venice. There is nothing incongruous about it, nothing strange. The New York of the future thus adapted to the requirements of a far greater population is no more strange than the New York of to-day. But it will be infinitely more convenient and harmonious. Venice is the adaptation of a city to the necessities of the terrain on which it is built. The New York of the future will be an adaptation of the metropolis to the needs of traffic, freeing the city from the unsightly congestion and turmoil of the present. Pedestrians will move about through the arcaded streets, out of danger from traffic, protected from the snows of winter and the glare of the summer sun. Walking would become a pleasurable pastime, and would cease to be one of the most hazardous of occupations. Shopping would be a joy. The overwrought nerves of the present New Yorker would be restored to normalcy, and the city would become a model for all the world.

This seems worth while, worthy of a great effort, and certainly warrants a trial, provided, of course, that it accomplishes what we started out to accomplish, namely, a system of traffic division so perfected that the city can continue to grow and the streets can still take care of the increasing traffic.

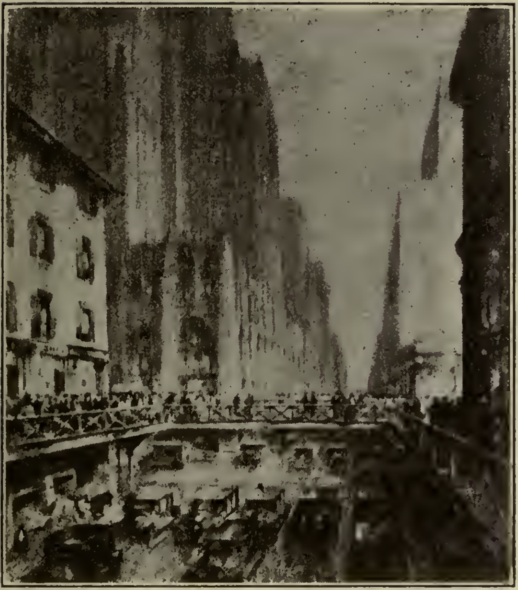
If street capacity is to keep pace with the increasing bulk of buildings, we must provide an elastic method of enlarging the street capacity. How can this be done if streets are neither to be widened nor increased in number? We find in certain sections of New York, where buildings are now up to or beyond the bulk limit set by the zoning law, that traffic—in spite of one-way direction and many other stringent police regulations—still moves, although it moves haltingly. We believe that if the existing capacity of such streets could be increased, say, several hundred per cent, the process being gradually applied, then we could be safe in assuming that sufficient capacity would be assured for all time.



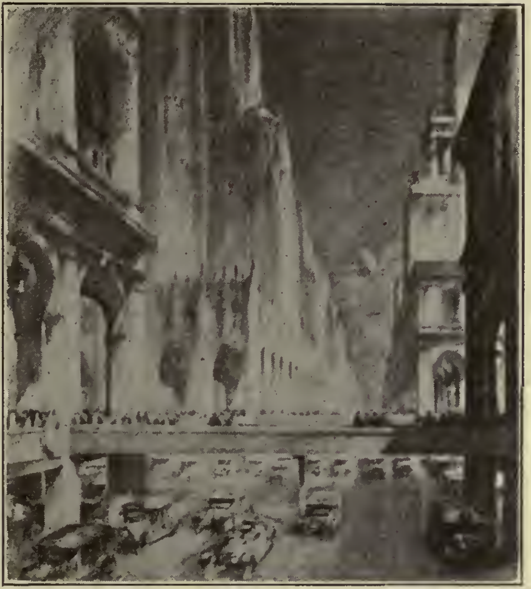
PRESENT CONDITION



STEP NO. 1



STEP NO. 2—BUILDING LINE ARCADED ON STREET LEVEL, PROVIDING ADDITIONAL SPACE FOR LOADING OF TRUCKS AND PARKING OF AUTOMOBILES

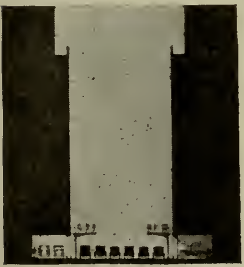


STEP NO. 3—ELEVATED SIDEWALKS CONNECTED BY BRIDGES ACROSS THE STREET, COMPLETELY SEPARATING PEDESTRIAN AND WHEEL TRAFFIC
(For Step No. 4 see front cover and footnote *)

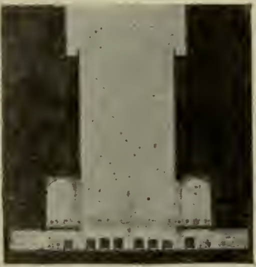
Can Such an Increase of Capacity Be Secured?

Let us examine conditions in a typical cross-street in the gridiron section, such as one finds between Fifth and Seventh Avenues, in the thirties. Here we have only one-way streets, with 30-foot roadways from curb to curb. In order for business to continue, vans must stop in these streets, to load and unload, other trucks and vans must move through, and autos must park at least temporarily. Even the casual observer notes not only that these streets are one-way, but that one machine at a time can barely go through. This one machine is often stalled for several minutes while there is no movement whatever, and this is not caused by the stopping at the corners for north and south traffic, but just the stopping necessary to the life of that particular block.

Assuming, then, that these streets at congested hours have only a one-machine roadway left open, that means that the effective street space is at the most 10 feet wide.



STEP NO. 2



STEP NO. 3

Let us now take the first step in this contemplated change of levels, and build a raised sidewalk the length of the block on both sides. This can be constructed on piers built a foot or two from the building line, and carrying a cantilever beam with the short end in the building wall for a shoulder. The old sidewalks become additional street space, the necessary room for loading and unloading vans and parking autos is provided, and the portion of street left free for moving traffic is increased from 10 feet to at least 30 feet, an increase in capacity of 200 per cent.

Let us assume that this in time becomes crowded. What is the next step?

A law is passed, a building act similar to many already on the statute books, regulating the height of the second tier of beams of all future buildings in certain zones, also a fixed spacing of column points, and a certain clear arcade height on the second-story level. When a block has been rebuilt (not so long a time as one might imagine when one sees the rate at which buildings change in New York) the temporary cantilever sidewalk is removed, the new arcaded sidewalk opened, the space under the sidewalks opened for vans loading or unloading, or motor parking. The street available for moving traffic has widened to 60 feet —an increase of 300 per cent more—making a total of 500 per cent.

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* Step No. 4 is shown on the front cover of this issue. In this final stage of street evolution, all cross-street traffic passes under north and south traffic, doing away with the present congestion caused by cross-currents of vehicular movement. Pedestrians use the upper sidewalk level, bridged at all streets in both directions.

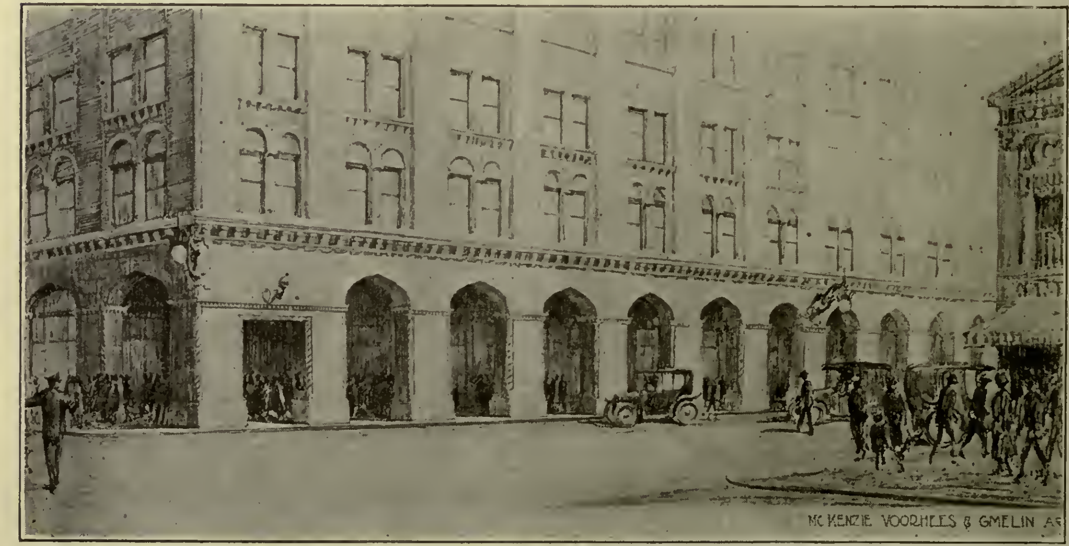
Supposing even this to become crowded, what is the next move? Additional space under the buildings is taken for all motors at rest, the space under the arcaded sidewalks is taken for slow-moving traffic, and the street has increased in capacity by another 200 per cent. And the process can continue (thanks to the fact that the foot traffic has been raised) ad infinitum. In fact, it could continue until the entire surface under the buildings was available for traffic, if ever such a condition demanded it.

We have been considering only a narrow street and have shown a method of gradually increasing its effective traffic capacity up to and even beyond 700 per cent. This all applies with equal or greater force to the wide north-and-south avenues of the city. Their traffic capacity could be increased to the same extent by the same gradual process.

Remembering again that the foot traffic has been raised, and that of necessity the shopping-level, store-front-level and business level have all come up with it, one of the principal obstacles to "basket weaving" the street crossings has been removed, namely, the objection to a varying level of store fronts. Under our present system of street, sidewalk, and store front all on the same level, any change of grade such as occurs when one street passes over or under another, creates a condition bad for appearance, and bad for business.

But by raising the people and the shops, you have only the vehicular traffic to deal with and "basket weaving" the crossings becomes comparatively simple, with the result that a motor could then move from any point in the city to any other point at any time without a single stop. We do not attempt to estimate what per cent of increase this would mean, but any one who has noticed how rapidly a street clears when interruptions cease must realize that such a system would probably be the greatest factor of all in augmenting traffic movement.

In conclusion, we believe we offer a solution of the traffic problem of the city of New York, particularly of Manhattan Island, which is sufficiently comprehensive to meet all contingencies, and sufficiently gradual in its progressive development to be possible of realization.


MC KENZIE VOORHEES & GMELIN AS

ARCADED SIDEWALK OF BUILDING NOW UNDER CONSTRUCTION ON VESEY STREET, NEW YORK

Prior to the approval of the type of building above shown, the Board of Estimate and Apportionment had been considering the widening of Vesey Street between Washington and West Streets, by acquiring a strip of property on the northerly side of the street. It was subsequently decided, however, to accept the proposition made by the New York Telephone Realty Corporation that if the city would consent to abandon the proposed change in the street width, the Corporation would consent to the construction of an arcade within the building line with a sidewalk width of 17 feet and a height of at least 18 feet, the effect of which would be to permit of widening the roadway from 30 feet to approximately 44 feet through the inclusion within its lines of the sidewalk now in use on the northerly side of the street. A detailed report on this subject, with much valuable information regarding arcaded sidewalks in American and European cities, is obtainable from Arthur S. Tuttle, Chief Engineer of the Board of Estimate and Apportionment, City of New York

A Street-Lighting Program for the District of Columbia

By John Elliott Wood

Captain, C. E., U. S. Army, Assistant to Engineer Commissioner, District of Columbia

WASHINGTON is not now included among the American cities possessing good street lighting. Lighting in the District of Columbia is admittedly inadequate. The present condition, regrettable as it may be, is justified on two scores: first, that the lighting is consistent throughout all developed streets, parkways, alleys, etc.; and, second, that all money available for lighting is spent to the last penny, presumably judiciously.

The unit cost of street lighting is regulated by Congress. The rates are based on a fair return to the power company. They are subject to adjustment by the Public Utilities Commission. The sum annually appropriated by Congress for the purpose fixes the quantity of street lighting available for the year.

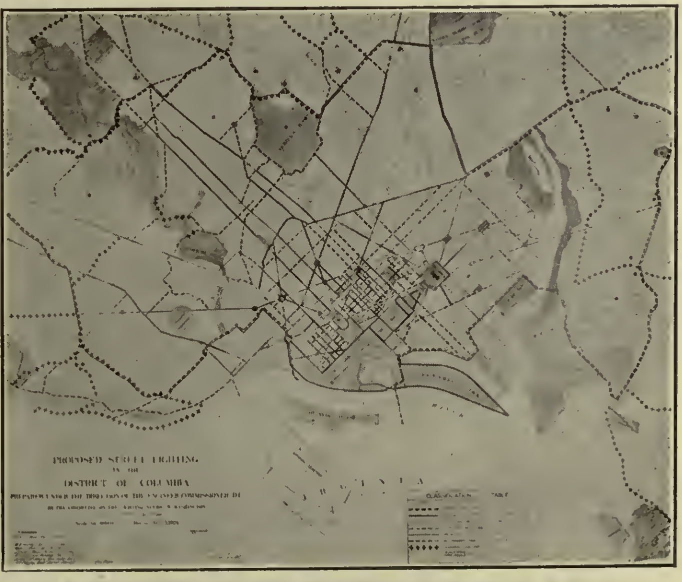
Washington's present lighting is approximately 60 per cent electric and 40 per cent gas. Within the fire-limits no overhead wires are permitted. These limits embrace that territory roughly circumscribed by a three-mile radius from the congested business area. Streets are lighted at a cost slightly less than $1 per capita on the basis of a population of 450,000 persons. Lighting in Federal parks and flood lighting of the Capitol are included in this calculation. In contrast to most American cities, there is no lighting except that furnished from public funds. No white ways are maintained in Washington at the expense of business organizations. This fact has pertinent application when cost comparisons are made with other cities.

Few of the streets of Washington are satisfactorily illuminated. On account of its outstanding sentimental importance Pennsylvania Avenue between the Capitol and the Treasury has been particularly favored. Its brilliancy is 265 lumens per linear foot. It is, however, 160 feet in width. Conservative judgment would increase this intensity 50 per cent without danger that the street effect might compete with the desirable predominating brilliancy of the flood-lighted Capitol.

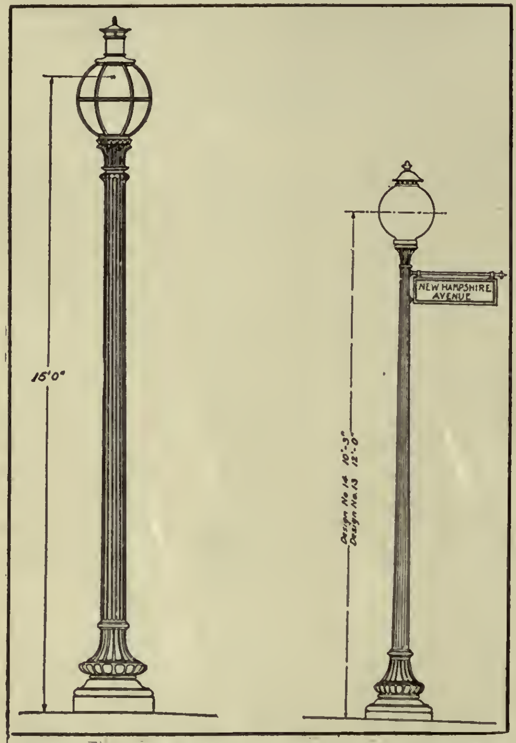
The important avenues average less than 20 lumens per linear foot. The majority of residential streets average but 4 lumens per linear foot. Within the past year short portions of 15th and 17th Streets, Northwest, in a much-traveled district, have been improved to 28 lumens per linear foot. These quotations are indicative of a low standard of intensity not common in the average progressive American city.

The Fight for Better Lighting

Washington has fought gamely to keep pace with the lighting art. It has accomplished as much as appropriations would permit. Small increases for the purpose of lighting have been made during the past five years. But during the last three years Congress has provided $20,000 a year for the replacement of gas and lesser effective electric lamps. The increase in maintenance was not enough to pay for the increased amount of current re-



PLAN OF FUTURE STREET LIGHTING IN WASHINGTON, D. C.
The faint lines represent the street plan of Washington. The heavier lines represent the type of lighting as explained in the classification table. The lighting on all streets is "Residential" unless otherwise indicated



TYPES OF LUMINAIRES USED IN WASHINGTON
At left, ornamental luminous arc, and at right, ornamental incandescent electric lamp

quired by the improvements.

A Representative Committee

A continuing condition of this sort demanded some drastic change in policy. Accordingly, during the past year the Engineer Commissioner ordered a comprehensive study of local street lighting so that the problem could be presented to Congress in a complete, convincing and appropriate manner. To carry on this work there was appointed a committee representative of the best professional and least-biased personnel available. It embraces choices of the municipal Engineer Department, the Public Utilities Commission, the United States Bureau of Standards, the local section of the American Society of Electrical Engineers, and the local electric and gas lighting companies.

From the beginning it was apparent that some unit of lighting must be adopted. Results should be expressed in definite terms. Careful deliberation resulted in the adoption of the lumen as the unit, and the application as in lumens per linear foot of street. The factors entering into illumination and visibility, such as street surface, foliage, background, and a hundred others, were of such variety that measure at source was the only rational means.

Analysis of the Problem

The preliminary work of the committee consisted of a study of a map showing existing lighting and of equipment now in use. Suggestions were invited from the leading lighting industries throughout the country. All matters pertaining to illumination present and possible were discussed in conference. The proposals submitted by commercial illuminating interests were carefully analyzed and adopted where desirable. The results of studies extending over a six months' period were then incorporated in a map of the highway system of the District of Columbia. This tentative plan showed graphically the comparative treatment proposed on each street. It was explained by an accompanying key, as indicated on page 7.

Detailed study was then given, with due consideration of local development and prospective growth as indicated by zoning. Zoning regulations are based on natural tendency of development. It was found that many outlying sections required more immediate attention than others. There were occasional business sections which formed remote centers of activity. Certain intersections and points of traffic congestion required particular lighting treatments. Suburban roadways of negligible local importance were integral parts of through routes of travel. It was necessary to allocate lighting betterments with some regard to comparative state of growth. A peculiarity of Washington's mental attitude required some fairness in geographical distribution. As a result, a new and complete map in dimensions 4 by 5 feet, scale 1 inch to 1,000 feet, was prepared. This map is the basis for lighting improvements in the District of Columbia. Differences in treatment are shown in color and line. It is reproduced without color herewith. Its careful differentiation between thoroughfares of business, traffic, residential and suburban highways provides a vivid plan of Washington's civic development. It expresses in a general way the character of any particular geographical portion. It will maintain its value for a period of approximately ten years.

Classification of Lighting

The outstanding results of this survey are the elimination of gas lighting and the establishment of a standard of lighting in accordance with the following classification table:

Character of Street	Lumens per Linear Foot Minimum	Lumens per Linear Foot Maximum
Pennsylvania Avenue type, or special	Arbitrary	
Primary business	275	400
Secondary business	135	200
Outlying business	125	200
Primary traffic	100	125
Secondary traffic	60	80
Residential	25	50
Highway or suburban	Arbitrary	

The extent of elimination of gas lighting should be determined by the provision of underground electric circuits. Gas lighting is preferable to overhead wires.

Extensions of service are made by the lighting companies as ordered by the District of Columbia government. Results are generally compensated. Any inequalities, inequities or excessive profits are carried over from year to year with ultimate adjustment in rates. The relations between the local government and the lighting companies are regulated by statute. They are entirely harmonious and effective.

The proposed lighting plan with its classification table was supplemented by estimates of cost. The municipality is to furnish the metal standards. All station equipment, underground work, lamps, etc., are to be furnished by the lighting company. This being purely an investment increases the company's valuation accordingly. Appropriations, however, must be provided for that part of the investment furnished by the municipality. The cost items are separated into: (1) capital cost of equipment; and (2) continuing cost of annual maintenance, lighting, and other factors essential thereto.

These figures are based on the minimum standards as shown in the classification table.

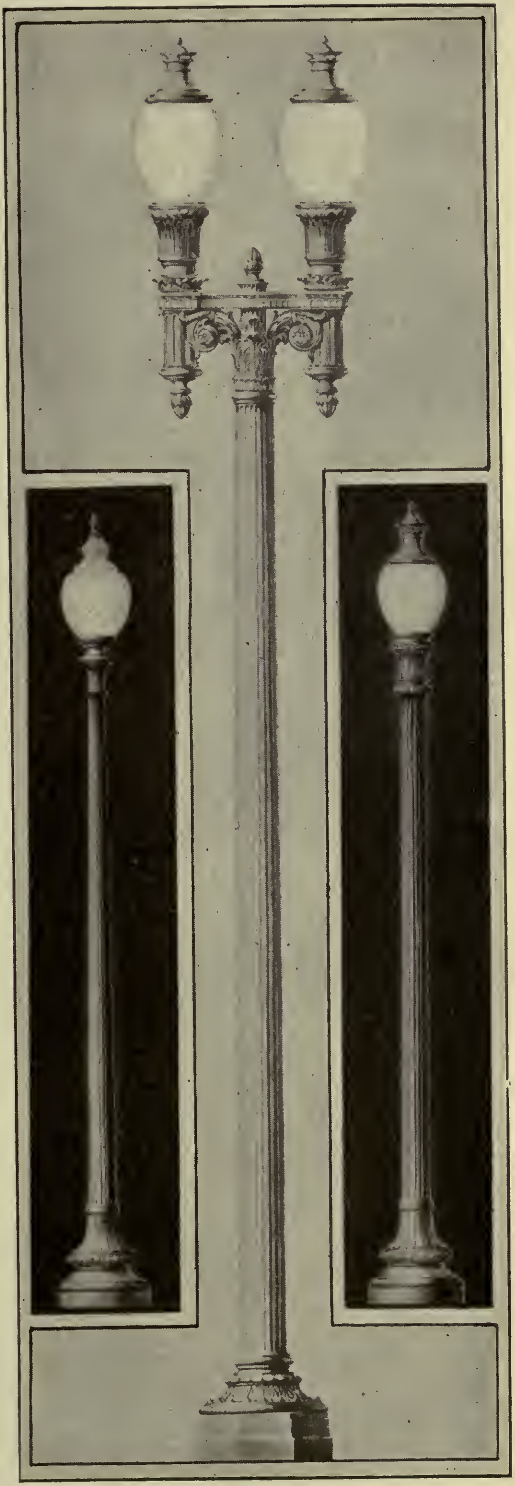
Plan of Execution

The plan was approved by the Commissioners on March 18, 1924. Physical changes are to be effected on a five-year basis contingent on provision by Congress of the necessary money. The Commissioners are requesting five annual appropriations:

(1) As capital investment for equipment $200,000 each; and (2) a corresponding annual increase in the continuing appropriation for lighting and maintenance, as follows:

Now	$ 472,000
1st year	700,000
2nd year	800,000
3rd year	900,000
4th year	1,000,000
5th year	1,500,000

This improvement will bring the lighting of Washington to a point of favorable comparison with lighting in the leading American cities. It will not reach a standard higher than should be expected in the National Capital.



PROPOSED NEW LUMINAIRES

At left, for incandescent, mounted up to 18 feet; center and right, luminous arc, mounted 22 feet and 15 to 20 feet, respectively

COMPARISON OF COST TO THE DISTRICT OF COLUMBIA OF THE TENTATIVE AND FINAL STREET-LIGHTING PLANS

	Tentative		Final	
Designation	Capital Cost to Municipality	Annual Cost of Lighting	Capital Cost to Municipality	Annual Cost of Lighting
Pennsylvania Avenue type				
Primary business	$ 154,449.00	$ 125,498.80	$ 101,124.25	$ 78,948.80
Secondary business	93,760.00	113,582.00	71,535.75	70,662.90
Outlying business	70,400.00	92,400.00	95,680.00	125,580.00
Primary traffic	170,100.00	213,333.75	295,320.00	370,380.50
Secondary traffic	261,450.00	333,668.30	130,455.00	166,547.55
Residential and park	634,500.00	526,235.00	432,300.00	301,313.10
Highway lighting	....	42,282.15	....	35,445.15
Totals	$1,384,659.00	$1,447,000.00	$1,126,415.00	$1,148,878.00

Equipment

The lighting standard in current use is generally known throughout the country as the Washington standard. The design is exceptionally fine and has been copied with regretted and damaging modifications throughout the world. It is a cast-iron standard of 10 feet 3 inches and 12 feet mounting heights for incandescent, and 15 feet for arc lamps. The improvements contemplated in the survey required the design of higher units. In increasing the height it became necessary to provide a steel core which would give stiffness to the fixture and structural support to the more fragile lighting portion. The designs were made under the direction of the National Commission of Fine Arts. The old and new designs are shown on pages 8 and 9.

The popular mounting height of units seems to be as changeable as the predominating color of Easter garments. A few years ago the favorite mounting height was no higher than that required to protect the curious passer-by from personal injury against high-voltage current. Safety to person fixes the minimum mounting height at 7 feet 6 inches. The maximum economic mounting height is probably below 40 feet. Somewhere between these limits are the proper mounting heights, depending within small limits, upon local conditions. Certainly, the late tendency has been to increase the height from below 10 feet to above 15 feet. The most successful recent installations in the country are between 15 and 25 feet. Experiment alone can determine the proper height.

One of the features which will fix the height of lighting on residential streets in Washington is the interference effect of comparatively young trees. Practically all the streets in Washington have trees on both curb lines. The reflecting and filtering effect of foliage is still a matter of opinion. Only divine foresight can foretell the result without exhaustive trials of varying heights, intensities, and types of projectors.

If a city is confronted with the necessity of determining the proper mounting height, it should secure some means of solving the problem during the current administration, say within three years. The most logical means would seem to be trial of the extreme limits, lowest and highest. Both of these will result in errors. The good points of each should be developed and the faults eliminated. Within the period of a single responsible individual the problem thus will have been reduced to a standard of considerable duration. In Washington's case it is realized that any height under 15 feet, in spite of young trees, is ineffective. The logical step, therefore, is to make trial installations of a 25-foot height. Pronounced conservatism, however, combats this somewhat radical step. It is necessary to make future installations at heights of 15, 18 and 20 feet. It is most likely that this arbitrary choice may result in a proper solution.

Technical Skill Required by the Program

Such a study as that undertaken in Washington could hardly be made except at considerable expense for the necessary technical and clerical services. Strangely enough, this particular survey and report was secured virtually without cost to the city. It was made possible by the intense interest and public spirit of technical experts who generously gave their talents and time rather than see the National Capital grope further in its obsolete and insufficient lighting. In no manner other than in committee conference could there have been evolved such a comprehensive and high-class program. During the progress of the more routine work the study was constantly under the supervision of the lighting committee. Messrs. Hadley, Allen, Meyer, Patterson, McIlhenny and Cheyney were ably assisted by W. D'A. Ryan and his force of experts from Schenectady, N. Y. To these public-spirited engineers who gave so freely of their enthusiasm and ability toward the cause of better street illumination Washington will be extremely indebted.

MUNICIPAL SWIMMING POOL, WASHINGTON PARK, MONTGOMERY, ALA.

Making Swimming Safe for the People

By W. Bruce MacNamee

National Headquarters, The American Red Cross

THE unparalleled growth of aquatics in the United States within the past decade has amazed those who see in the building of a nation of swimmers a chance to raise the national health standard to the level that prevailed in ancient Sparta. There is not in history an instance where such numbers of people have taken to a sport with such universality. The country bids fair to become a vast swimming club. Even in inland cities and towns far from rivers, the high school pool is an institution. The effect of all this activity is to arouse unprecedented interest in the future of swimming as a national asset and at the same time to develop means of making it safe for the people.

The latter development is of particular concern to city governments. Water transportation placed most cities on navigable streams and the oceans. Civic authorities generally are recognizing the increasing public demand for swimming facilities. Coincidentally rises the problem of providing these facilities and safeguarding their users. How this problem is being solved is best illustrated by citing the experiences of some of our larger cities.

Life-Saving Instruction and Results

Boston is conducting one of the most aggressive campaigns for water safety in its history. Life-saving instruction in The Hub is coordinated and directed largely through the Boston Metropolitan Chapter of the American Red Cross, and a strong Health Service Committee, composed of public-spirited citizens, with Professor C. M. Hilliard, of Simmons College, as Chairman. Field directors and life-saving instructors of the New England Division of the Red Cross started the instruction courses and examined thousands of swimmer aspirants. The latter are required to pass the rigid Red Cross tests before they can qualify as Life-Savers. These tests call for actual demonstration in the water of each swimmer's ability to undress, break death-holds, and tow helpless persons to safety.

The very important qualification of being able to resuscitate apparently drowned persons also must be demonstrated, both in theory and in practice. The method of inducing artificial respiration in persons taken from under water has been successful in cases of 30-minute submersion. Red Cross instructors in Boston worked incessantly in pools, at beaches and in the theaters, where life-saving technique was exhibited to thousands in glass tanks, so that all might see and learn.

The success of this concerted drive by municipal and state authorities and the corps of Red Cross instructors is readily demonstrable. In three years the Boston Red Cross Chapter has multiplied its life-saving corps ten times. The Boston police force, under orders from Police Commissioner Wilson, abandoned its antiquated methods for modern Red Cross technique and already has saved hundreds of lives. Simmons College, the Y. M. C. A.'s and other organizations have developed large classes of life-savers under Red Cross instructors. River and beach patrols have been organized, and the final result is to make Boston and its environs one of the safest areas in the country for the many thousands who daily enjoy the most thrilling and health-giving of all sports.

ENJOY THE WATER IN SAFETY

Swimming, canoeing, wading and all forms of water Sports are healthful and wholesome. They can be enjoyed without the fear of tragedy by observing a few common sense rules. Swimmers and non-swimmers should observe the following "Don'ts."

IF YOU CANNOT SWIM

DON'T—Wade unless you know the depth of the water
DON'T—Go wading alone or where there is a swift current
DON'T—Go canoeing unless accompanied by an experienced swimmer

IF YOU CAN SWIM

DON'T—Attempt long swims early in the season. (Wait until you get in condition)
DON'T—Swim on a full stomach. (Wait at least two hours after eating)
DON'T—Swim if overheated.
DON'T—Swim until exhausted.
DON'T—Dive without accurate knowledge of the depth of the water
DON'T—Cry for help in fun. (You may some time need help and not get it)
DON'T—Go in swimming alone.

CANOEISTS

DON'T—Attempt canoeing without some instruction in paddling.
DON'T—Stand up or change seats unless ready to swim out. (Many deaths result from this)
DON'T—Try to scare your companion by rocking the Canoe. (It isn't smart and may cause a death)

The Red Cross will give you free instruction in Life Saving and Resuscitation

ST. LOUIS CHAPTER AMERICAN RED CROSS
802 Equitable Building,
St. Louis, Mo.
Bell—Olive 7300 Kinloch—Central 6900
"EVERY SWIMMER A LIFE SAVER"

Chicago and St. Louis have been as successful as Boston in making the water safe for their citizens. The tragic Eastland disaster, in which hundreds were drowned within a few feet of safety, spurred Chicago's interest in life-saving. From that time in 1915 more than 10,000 swimmers have qualified as Life-Savers in that city, and the campaign is expanding. Duluth, Minn., has taken up Red Cross life-saving instruction with a vim, and in Detroit the public schools have formally adopted the Red Cross life-saving course.

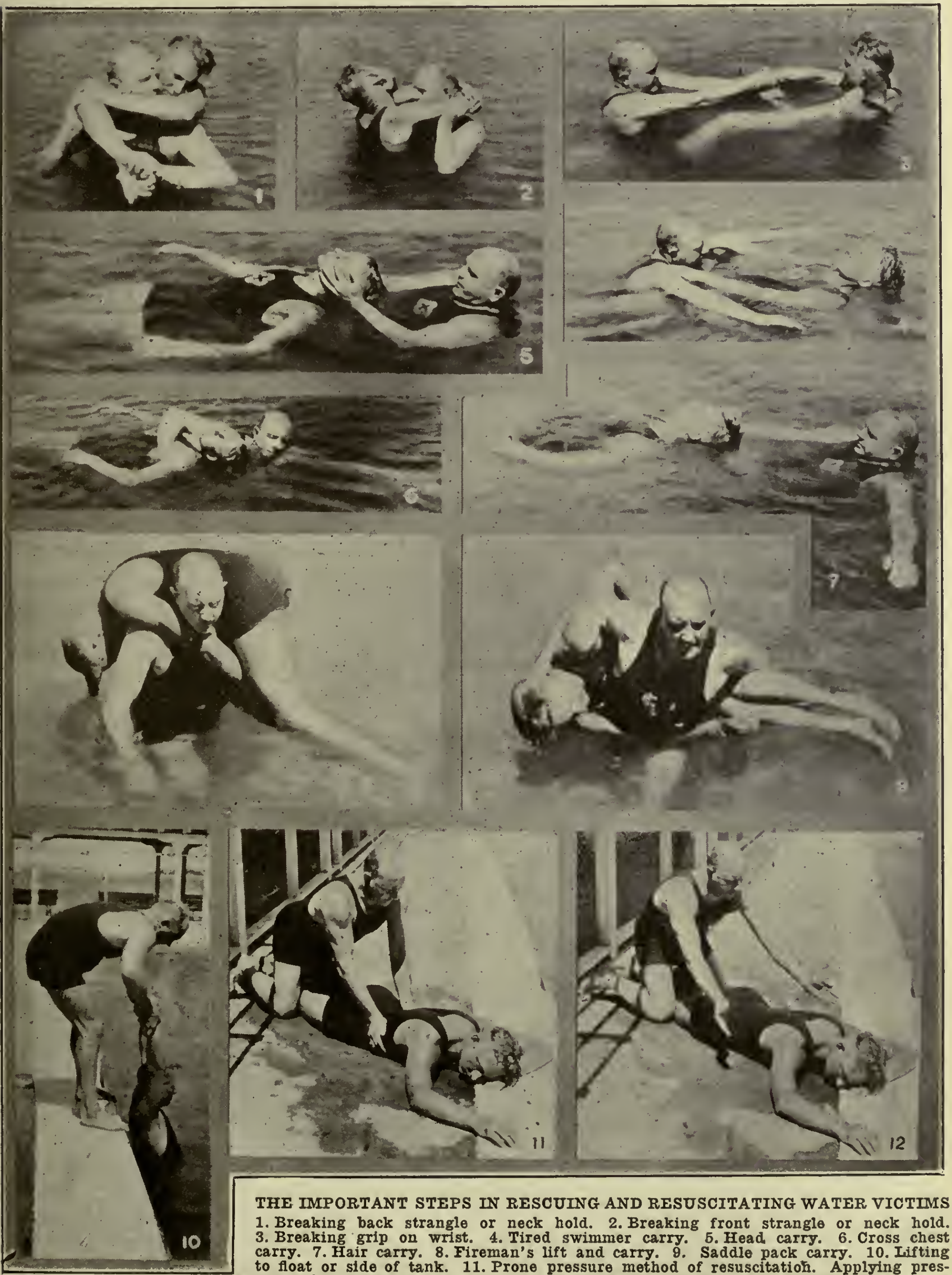
St. Louis is one of the shining examples of what can be accomplished to make swimming safe for a municipality. Not long ago the St. Louis Chapter of the Red Cross called for the services of a national life-saving expert to study the problem presented by numerous drownings in the Meramec River, the city's water playground. Owing to sudden rises and an ever-shifting sand bottom, this river was found to be very treacherous to the thousands of canoeists and swimmers who frequent it. By a series of public meetings, life-saving demonstrations and a general safety campaign up and down the river, drownings have been practically eliminated. Now the Red Cross maintains a patrol of the river, makes weekly inspections of life-buoys and first-aid kits and has divided the river into zones, each in charge of a captain and crew of Red Cross life-saving volunteers from the clubs and bungalows lining the banks.

Aid Available for Water Safety Campaigns

Such a plan, so effective and yet so inexpensive, can be put into operation anywhere in the country where the local municipality seeks the cooperation of the Red Cross. It is necessary only to notify the Red Cross chapter which exists in every city. Such notification will bring to the assistance of the community trained experts in life-saving, prepared to organize and direct water safety campaigns. This service is without charge.

This year the Red Cross, because of the heavy demands for its instructors in water safety, has organized five life-saving institutes, where a normal course is given to camp councillors, Boy Scout Masters and similar officials. A conservative estimate places the number of persons who will receive Red Cross life-saving instruction this year at close to 1,000,000. The Boy Scouts of America, 600,000 in all, are joining with the Red Cross in this most extensive campaign of water safety ever attempted in this country. In the great military training camps, Red Cross personnel, by agreement with the War Department, will be on hand to instruct the thousands that attend. Other Red Cross instructors will cover numerous summer camps, schools and colleges.

The campaign is a matter of geometrical progression. One Red Cross Life-Saver is a potential instructor to thousands. There are



THE IMPORTANT STEPS IN RESCUING AND RESUSCITATING WATER VICTIMS
1. Breaking back strangle or neck hold. 2. Breaking front strangle or neck hold. 3. Breaking grip on wrist. 4. Tired swimmer carry. 5. Head carry. 6. Cross chest carry. 7. Hair carry. 8. Fireman's lift and carry. 9. Saddle pack carry. 10. Lifting to float or side of tank. 11. Prone pressure method of resuscitation. Applying pressure. Out goes the bad air. 12. Prone pressure. Release. In comes the good air

Demonstration by Capt. Jack Wallace and Larry Peterson, of the Boston Metropolitan Chapter of the American Red Cross, of the steps a qualified Red Cross Life-Saver takes in rescuing the drowning now 45,000 Red Cross Life-Savers enrolled throughout the country. In the last few years the movement has literally leaped forward. It has resulted in the saving of thousands of lives. When it has almost eliminated drownings in this country, the American Red Cross will feel that its years of application to the problem of water safety have prepared the way to safe enjoyment of the most thrilling and healthful of all sports.

The Increasing Cost of City Government

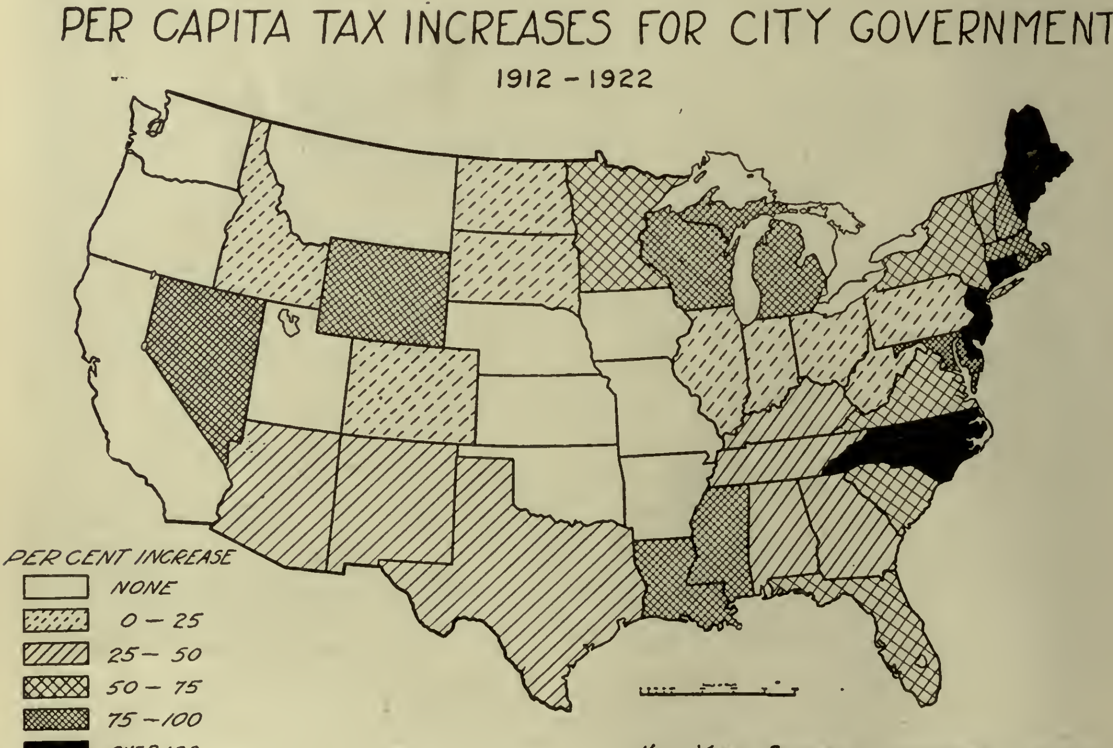
By Luther Gulick and Charles F. Aufderhar
New York Bureau of Municipal Research

THERE is a growing job ahead for the cities. The last census showed not only a continued drift of population to the cities, but that the movement is speeding up. In the ten years 1910 to 1920, city population increased five times as fast as rural population. More than half of the people of the United States now live in urban communities with 2,500 or more population.

The cost of running the government in these communities is going up faster than the population, according to a recently released report of the Department of Commerce. In the ten years 1912 to 1922, the receipts from taxes to meet the expenses of local government in the 2,787 urban centers increased 80 per cent, while the population increased but 29 per cent. Even so, the taxes collected for state and county governments have increased faster.

The map on this page shows by states the per capita tax increases for ten years. Just what does the map mean? That is not an easy question to answer without a great deal more information than is contained in the preliminary statistics. Why has the per capita cost of city government in some states increased faster than others? Why has it decreased in some states? Are these facts, or merely "statistics"?

It is interesting to note that the states do fall together roughly in somewhat logical groups. The entire western coast and a compact group of states in the heart of the Mississippi Valley show a decrease in the per



PER CAPITA TAX INCREASES FOR CITY GOVERNMENT
1912 - 1922

NEW YORK BUREAU OF MUNICIPAL RESEARC

capita cost of government. The greatest increases are along the eastern seaboard. Illinois, Indiana, Ohio, Pennsylvania and West Virginia form another compact grouping. It is interesting that Ohio, with its stringent tax limit legislation, does not appear to have held taxes down any more successfully than its neighbors.

The growth of population naturally produces increased government costs. For this reason, the figures have been reduced to a per capita basis for presentation on the map. Nevertheless, the question arises: Is it not the states with the more nearly stationary population which show the greatest per capita growth of tax levies? This does not appear to be the fact. The white states on the map show a population increase of 34.1 per cent as compared with 41.9 per cent for the states in the third class, like Texas, and 30.3 per cent for the black states. The smallest increase in population, 22.8 per cent, is found in the fourth group, including New York.

The chief causes which have been pushing up the cost of government in the last decade have been: the change in the value of the dollar; the demand of the people for more and better governmental services and for public improvements; the growth of the size of cities; the development of new problems of government, especially due to new inventions, like the automobile; and finally, the continual pressure of enthusiasts, bureaucrats and politicians for the enlargement of budgets. What part these various expansive and expensive forces have played in the past ten years in each of the cities, few are qualified to say. It is certain, however, that the shrinking value of the dollar alone is enough to explain a large part of the tax increase. But even so, why should the increases by states vary so? All cities have been using approximately the same dollar.*

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* This is based on the Department of Commerce report, "Taxes Collected." It is an advance section of the 1922 Census of Wealth, Debt and Taxation. The term "taxes" is taken to include general property taxes, special taxes, poll taxes, licenses, permits, and special assessments. School district taxes are not included. In making per capita computations, the census figures for 1910 and 1920 have been used as presented in Census Monograph No. 1.

St. Paul Is Building Schools at Less Cost per Capita

THE Department of Education of St. Paul, Minn., is now embarked upon a five-million-dollar school-extension program. The local Bureau of Municipal Research has raised the question of whether these buildings are being constructed economically, and has answered it in the affirmative:

"A comparison between the cost of school buildings erected during 1920 and those recently completed is pertinent.

Year of Erection	School	Pupil Capacity	Cost
1920	Homecroft	320	$160,729
1920	Groveland Park	320	164,749
	Average cost per pupil....		$508

Year of Erection	School	Pupil Capacity	Cost
1923	Linwood	560	$203,925
1923	Farnsworth	560	210,851
1923	Franklin	960	246,696
1923	Jefferson	1,200	333,333
	Average cost per pupil....		$303

"The above figures show a decrease from $508 to $303 in the average cost per pupil of accommodations. The reduction is not due to any great extent to lower costs of labor or materials. The result was brought about by eliminating waste in design and arrangement, standardizing plans, and building larger units, as well as securing wide competition on each job. From eight to fourteen firms are now bidding on each building where one or two formerly submitted bids.

"Another reason for lowered costs is that schools, instead of being built by city forces, are now being erected by contractors who secured their jobs in a field of wide competition.

"Because of the organization that is required and because of the equipment necessary, it is improbable that city force account will ever be able to compete with private firms. This explains why no city, to the knowledge of this Bureau, has built up an organization to erect its own school buildings."

Cleveland Police Point the Safety Way

WHEN the history of the Republican National Convention is written in the calm light of retrospect, a long chapter should be devoted to the Cleveland police force. It would be impossible to estimate the number of lives and limbs it saved during the hectic week when the city's streets were jammed with visitors. It is important to know that the foundation of the work was an anti-jay walking rule made absolute.

The Cleveland police faced a big job and they went at it in a big way. All of the hotels housing the convention hosts were within a dozen blocks of the meeting hall, and this meant extreme concentration. The rush to the hall extended over a considerable period and the task of handling the crowds at the principal street intersections was comparatively easy, but when each of the several sessions of the convention adjourned there was a throng of thousands sweeping away from the lake front and toward the center of the city. Through the exits of the hall poured about 13,000 persons, while anywhere from 30,000 to 50,000 more moved from the adjoining public square, where they had listened to the proceedings by radio.

The police showed that they were well drilled and that they knew their work. They were courteous and even gentle, but they were firm and they quickly taught the crowd that safety—and self-respect—lay in following their directions.

—*Newark* (*N. J.*) *Evening News.*

Danger Lurks in City Weeds

By Albert A. Hansen

Purdue University Agricultural Experiment Station

WE are all willing to admit that a rank growth of weeds in vacant lots, along alleyways and in other city waste places, is unkempt and unsightly, but do we realize that these ruderals are a menace to human health?

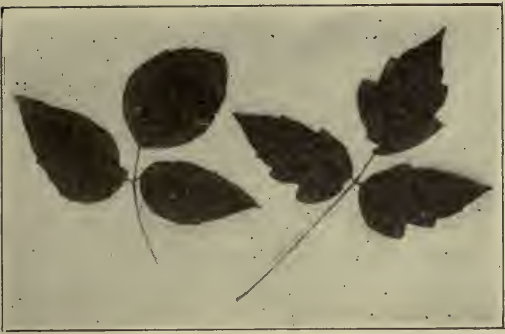
Take hay fever, for instance. Many urban sufferers blame their troubles on the pollen of goldenrods, under the mistaken notion that the wind carries the pollen from the country into the city. As a matter of fact, the pollen of the country-loving goldenrod is not carried by the wind, and this plant is practically blameless as far as hay fever is concerned. Nine times out of ten the real culprit is ragweed thriving under their very windows in unkempt back yards and lots. During the spring, before ragweed pollen is in evidence, most hay-fever suffering in our cities and towns is due to grass pollen, particularly foxtail. Occasionally a walnut, poplar or juniper tree may be responsible, but the bulk of the trouble can usually be traced to weedy grasses, ragweed, wormwood, cocklebur, sorrel, amaranth and pigweed growing in unsightly profusion in city waste places. Ragweed is probably the blackest villain of the lot, and hay fever sufferers will either have to get busy with sickles and scythes and produce ragweedless cities, or else find relief in the pollen extract treatment that has been developed through the cooperation of the botanist and the physician.

POISON HEMLOCK
The species held responsible for the death of Socrates. Occasionally found growing wild in city waste places

But hay fever and asthma victims are not the only ones who suffer from the ill effects of city weeds. A number of plant waifs in city waste places cause severe skin disease, called *dermatitis* by the medical profession. The leading offender in this respect is the well-known poison ivy. This baneful plant frequently thrives unrecognized in city lots, where it takes on a different appearance from the poison ivy of the country. Last fall, I was importuned by the editor of a Fort Wayne newspaper to locate the plant that had poisoned his family every fall for the past twenty years. He was sure it was not poison ivy, because as a youngster he became well acquainted with that particular species back on the home farm. Nevertheless, an inspection of his premises revealed a well-developed poison ivy vine, and there was little doubt of its guilt. Then there is wild parsnip, a frequent cause of skin eruptions, and even our old enemy the ragweed may cause dermatitis.

There are a number of other vacant-lot dwellers that are venomous to the touch, particularly to folks with sensitive skins and especially while perspiring freely. Principal among these offenders may be mentioned the poison elder or sumac, sometimes found in moist places, Indian tobacco, pokeweed, smartweed, Mayweed, fleabane and some species of buttercups. Poison ivy, however, causes more trouble in this respect than all the others combined. There is one case reported in which two little children became so severely poisoned by the terrible ivy while playing in a vacant lot in Washington, D. C., that death resulted. Although fatalities from ivy poisoning are rare, the plant must be considered as highly dangerous.

But the indictment against our city weed population is far from complete. Many a



THE LEAVES OF POISON IVY, A RATHER COMMON INHABITANT OF WEED-INFESTED IDLE LAND IN CITIES

The leaves vary in shape according to the amount of sunlight to which they are exposed

city vacant lot harbors such fatally poisonous species as poison hemlock, jimson weed and pokeroot. In this connection, Dr. V. K. Chestnut, of the United States Department of Agriculture, relates that "a boy was killed in New York by eating the seeds of a jimson weed which was permitted to grow in a vacant lot. His brother, poisoned at the same time, was saved only with difficulty. In October, two other cases occurred in New York. Four children were playing in one of the public parks of the city where jimson weeds were growing luxuriantly. The boys imagined themselves Indians and roamed about and ate parts of various plants. Three of them ate the seeds of jimson weed. One died in a state of wild delirium, another was saved after heroic treatment with chloral hydrate and morphine, the third, who ate but few of the seeds, was little affected."

Two cases of jimson poisoning in children have come under the writer's observation at Pleasant Lake, Ind., and both cases almost terminated fatally. Even sucking the flowers or blowing bubbles with jimson blossoms may cause poisoning.

While visiting Crawfordsville recently the writer noted an abundance of the deadly poison hemlock growing freely in the alleys of the town. A large patch was found within a block of the campus of Wabash College. Whether or not the plant has caused trouble could not be ascertained, but the inhabitants seem to be quite unaware of the presence of so dangerous a neighbor. Poison hemlock is perhaps the best known of our poisonous plants, on account of being responsible for the death of Socrates. The ancient Greeks of Athens had a pleasant habit of doing away with their criminals by compelling a drink of poison hemlock tea.

The case against city weeds as disturbers of human health is not as yet complete. Weeds prevent the prompt evaporation of moisture and so provide excellent breeding spots for mosquitoes, flies and other disease carriers. Not only that, but the concealment offered by a rank growth of weeds invites the dumping of garbage and other trash, a fact of which some thoughtless folks are prone to take advantage. The result is increased insect breeding and greater disease dissemination.

During the war, many city vacant lots were turned into gardens, which is an excellent way to solve the weed problem. Then, again, there is a crying need for open-air play space for children. A few of our cities encourage the conversion of vacant lots into playgrounds by offering owners exemption from taxes on idle land, providing certain improvements are made and the land made available for playground purposes for a specified minimum period. Some cities cooperate in the process of converting idle lots into lawns and small parks. A number of our cities, including Washington and Indianapolis, conduct annual weed-cutting campaigns. The interest on the amount of money expended on a single monument would in some cases be sufficient to control the weeds in all the waste or idle land within the city limits and would thus contribute materially toward the "city beautiful" ideal.

Certainly there are few points in favor of city weeds, and much can be said against them.

DESTROYING WEEDS IN ALLEYS WITH SODIUM ARSENITE SPRAY, WASHINGTON, D. C.

Overloading of Water Purification Plants

An Abstract of the Well-prepared Report of Committee No. 3 of the American Water Works Association on Practicable Loadings of Purification Processes

A PURIFICATION plant or any part of it is overloaded if it is unable to deliver a satisfactory quality of water, at the required rate of operation.

The term "satisfactory quality" itself needs some limitations. Applied to purification processes as a whole, where public water-supplies are concerned, it is synonymous with the currently accepted standards for drinking water. In other words, the final product must be free from objectionable turbidity, color, tastes and odor and incapable of causing infectious disease. Applied to the individual steps which make up the purification process, the above requirements, of course, do not hold, but each step must be considered in the light of its accepted function, which is not always the same for purification plants handling different kinds of water. With clear, badly polluted waters, filter efficiency is of paramount importance; with very turbid waters, or where softening is done, bacterial efficiency is relatively unimportant. On the other hand, the expectation in regard to basin efficiency is reversed for the two types named.

Local judgment as to "satisfactory" quality is not always a criterion. Numerous examples may be named where the community finds no objection to a water-supply plainly deficient to others accustomed to better water.

Failure of a purification process to deliver a satisfactory quality of water may be due to one or more of the following causes: inadequate capacity; excessive impurities in water handled; inferior design and arrangement; poor operation.

Problems

In considering the diversified arrangements and designs of water-purification works, handling as they do waters varying greatly in amount and character of impurities, the committee realizes the great difficulty of attempting to set even tentative limits upon the performance of the several steps which are comprised in the whole purification process. Skillful operation frequently has as much to do with the quality of the treated water as adequate and well-designed works. One plant of inadequate capacity and facilities may by the free use of chemicals bring about the same results as another plant of more liberal dimensions handled in an economical manner.

To this committee the attempts which have been made from time to time to set up a limit for the impurities in a raw water which would determine its utilization by purification plants, appear more or less futile, for we have before us the examples of numerous large municipalities which are compelled to utilize water-supplies polluted far beyond the limit advocated as a permissible loading, and yet these cities have typhoid and general morbidity rates so low as to challenge criticism. The logical step would appear to be in such cases an extension of the purification processes by pre-filters or double filtration as has been done at Albany and Philadelphia, in the case of heavy bacterial pollution, or the addition of filters or supplementary settling units in the case of plants handling excessively turbid water. The limit on extension of purification processes is largely economic and not the inability to obtain desired results under a given set of conconditions. McKeesport, Pa., demonstrated that the highly acid water of the Youghiogheny could be successfully purified, but later discovered that the price was so high that a change in the source of supply was justified. The committee feels that the ability of the purification plant to turn out consistently and continuously a satisfactory quality of water is the proper criterion for determining "overload" conditions, rather than the actual amount of impurities present in the untreated water, or the amount of water handled.

The rate at which water may be passed through a given basin or a filter is closely related to the impurities present in the water. In other words, the rate is only one of the factors determining "over-load." For example, rapid sand filters have customarily been designed in this country on the basis of 125 million gallons per acre, per day, following the precedent established by the Louisville experiments in 1898. The new Detroit filters, however, were designed for 160 million gallons per acre, per day, after local experimentation had shown that a rate of 200 million might be used without detrimental results. Obviously, there are certain limitations as to performance of any particular step in the purification process, and the Committee presents below certain tentative limitations for purposes of discussion, realizing it has not in its hands sufficient data to show that these limitations may not be exceeded without detrimental results.

Coagulation and Sedimentation

The function of the coagulation process is to cause or to complete the flocculation of suspended matter and color to settle out a substantial portion of the suspended matter.

The kind and amount of chemical required for coagulation are not discussed here in connection with practicable loadings. It is recognized that the amount of suspended solids, amount of color, sewage pollution and other impurities are related closely to the amount of coagulant required, but these factors have more to do with the cost of purifying water than with the ability of a basin to perform properly its functions provided a sufficient quantity of coagulant is used.

An exception might be made in the case of some trade wastes, which interfere markedly with coagulation and basin performance.

Practicable Loading of Coagulating Basins.—(*a*) Coagulating basins without filters will be considered overloaded when they produce a water with turbidity over 10 and color over 10, with disagreeable taste and odor.

(*b*) Basins followed by filters will be overloaded when they deliver a water with turbidity over 40 and in such coagulated condition as to result by filtration in an effluent with appreciable turbidity and with color over 10.

The limitations just named presuppose a correct application of chemical. Failure to meet the limits set indicates the need of preliminary sedimentation, additional capacity, modified design or a different chemical treatment, including effective mixing arrangements.

Although coagulating basins play considerable part in bacterial reductions, no limitations of bacteria are included above, because bacterial reduction is incidental to the main functions of basins as stated.

Settling-Basin Design.—The factors controlling basin performance are so varied that the Committee does not feel itself in position to formulate rules as to minimum retention period, depths, velocities, arrangement of baffles, etc. The great diversity of dimensions and arrangements shown by the tabulation (Proc. Amer. Water Works Assoc., 1913, p. 371) is such as to preclude the use of basin dimensions as a means of judging overload conditions. The actual performance of the basin is a much simpler and easier guide as to overload conditions of any particular installation.

Rapid Sand Filters

The function of the filter is to remove all appreciable suspended matter, including coagulated material and precipitated substances, to remove all living organisms excepting bacteria, to remove a substantial percentage of bacteria, and to remove a portion of the color.

Practicable Loading of Filters.—Filters will be considered overloaded if (*a*) they fail to deliver a clear effluent with an applied water having turbidity of 40 p.p.m. or less for a period of eight hours; (*b*) if they fail to deliver an effluent having a color of less than 10 p.p.m. after proper coagulation; color of 15 or even 20 is not objectionable, where the water is free from all suspended matter; in the case of waters containing 5 to 10 parts of suspended matter, a color of 20 is too high; (*c*) if they fail to deliver an effluent which after chlorination will not conform to accepted standards of bacterial purity.

The above limitations assume an applied water correctly treated with coagulant. The eight-hour period is specified as being the minimum practical length of filter run which will allow the plant to be washed continuously. Disregarding odors and tastes, the eight-hour period is a measure or limit of "overload" due to algae and other micro-organisms.

The Committee is not at present in possession of sufficient information to allow tabulation of a great number of rapid sand plants, but suggests that the individual plants collect such information for the purposes of discussion and comparison.

Disinfection

For the present, discussion of this subject may be limited to chlorination. Other bactericidal agents such as ultra-violet ray and ozone have so little application to water-supplies in this country that they need not be considered. Copper sulfate is regarded as an occasional agent principally in combating algae, although sometimes as a bactericide. No instance is known where copper sulfate is being fed continuously for reduction of bacteria. In considering chlorination no distinction is made between the use of liquid chlorine and hypochlorite, as they perform the same function, provided proper amounts are used and good regulation is secured.

Function of Chlorination.—The function of chlorination is to destroy bacteria, particularly those associated with sewage and known to be the causal agents of water-borne disease. A less common use of chlorination is for the destruction of algae or other organisms and the reduction of odors and tastes arising therefrom. Chlorine is most commonly applied to water after filtration, although in some instances application to settled water before filtration is advantageous. In absence of coagulation basins and filters, chlorination constitutes the principal protection for the supply.

Practicable Loadings for Chlorination.—Chlorination is overloaded if the treated water fails to conform to accepted standards for bacterial purity or if its use produces objectionable odors and tastes in the supply.

Secondary Coagulation

Definition.—Secondary doses of coagulant may be used for the following purposes: (*a*) to correct faulty primary treatment caused by accidental interruption or other under-treatment; (*b*) to remove the end products of softening with lime or soda ash in order to reduce sand incrustation and lime accretions; coagulant so used has a certain value in the way of recarbonation; (*c*) to supply an adequate mat to filter-beds when primary coagulation and sedimentation give too clear an applied water; (*d*) as a "split feed" where, for reasons of economy or improved results, separate applications of coagulant are made to different points rather than a single larger dose at one point.

The first item (*a*) needs no discussion. The second item (*b*) finds application only at St. Louis, where softening with lime is practiced; the third item (*c*) has limited application. The consensus of opinion seems to be that the same results may be obtained in a more economical and less troublesome manner by a careful adjustment of the primary dose and by attention to certain details of filter operation. The last item (*d*) is not generally practiced, although two plants in Ohio, viz., Portsmouth and Ironton, report economy and better operation by this method. The question of loading does not enter here, but it is obvious that secondary coagulation is limited by the clogging effect on the filters and the shortening of filter runs.

Standard Forms for Recording Data of Filter Operation

There is an obvious need of applying standardization to the collection and reporting of data bearing on the operation of water-purification plants. Many of the smaller plants do not make adequate records of the operation, while a common fault of the larger plants is the bewildering multiplicity of forms for recording data. Then again, there are conspicuous examples of well-operated plants where a good deal of attention is paid to supervision, yet the annual reports fail to contain essential operating data such as would be useful in making comparisons with other plants.

In considering the essential data to be reported, this committee has considered the meritorious prior work done by a committee of the New England Water Works Association (*Journal* New England Water Works Assoc., 1914, pp. 220-237; 1920, pp. 69-73). It has also taken into consideration the work done by Committee No. 16 of this Association (vol. 10, p. 462, 1923), along similar lines.

List A presented herewith is an outline of essential operating data suggested by this committee. The frequency of the collection of data outlined in List A is a matter to be determined by local conditions, such as character of attendance, nature of supply, etc. As a general proposition, the use of a single sheet or "daily log" is recommended for assembling the primary data of operation, excepting laboratory tests, which are more conveniently recorded separately. In some cases where the portions of the plant are isolated from each other, more than one log sheet may be justified, but the advantage of having assembled on a single sheet the principal operating details should not be lost sight of. No standard form of "daily log" can be offered as suitable for all plants, but it is suggested that the general items in List B be adapted to local conditions and used as column headings, the sheet being ruled horizontally to permit hourly readings. Logging the operation may not be necessary oftener than every two or three hours, but it is advisable to have space for recording readings oftener during unusual conditions. At small plants under limited supervision, a weekly log sheet may be preferable.

The Committee makes no recommendations as to form of report to be furnished by the purification department to the local administrative office, whether these reports are daily, weekly or monthly, except that it suggests that data so furnished be sufficiently complete to allow the preparation of annual summaries in accordance with recommendations below.

The Committee recommends that annual reports contain the following data on purification, in addition to general statistics elsewhere presented in the annual report:

1. Brief destruction of the sources of supply
2. General and special characters of the water handled.
3. Brief description of the purification system and method of treatment
4. Points of chemical applications
5. Kind of chemical feed devices
6. Rated capacity of works
7. Name of designer of principal features
8. Date works put in operation
9. Subsequent major additions, such as basins and filters
10. Cost of purification works, including what features
11. Available volume in plain subsidence basins, million gallons
12. Available volume in coagulation basins, million gallons
13. Net filter area, square feet
14. List of references to published descriptions of works
15. Comment on special operating experiences during past year
16. Summaries of operating results on recommended standard forms
17. Typhoid statistics

LIST A

Essential Operating Data of Purification

- *Water handled,* million gallons per day:
    - Raw water delivered to plant
    - Raw water lost by basin flushing or emptying
    - Treated with chemicals
    - Filtered
    - Used in washing filters
    - Delivered to distribution
- *Quality of water:*
    - Turbidity and color
    - Bacteria
    - B. coli
    - Microscopic
    - Chemical
    - Alkalinity and hardness
- *Chemicals applied, pounds:*
    - Alum, iron, lime, soda, and chlorine
    - Copper, amount and frequency of treatment
- *Filters:*
    - Number units washed
    - Length of runs
    - Final loss of head
    - Per cent wash water to water filtered
- *Electric power* (exclusive of main pumping):
    - For wash water and other pumps, chemical feed water, etc.
    - Lighting
- *Service water:*
    - For chemical solution, hydraulic valve, hose and flushing, toilet, etc.
- *Heating:*
    - Fuel used—pounds
- *Costs:*
    - Chemicals (including unloading)
    - Attendance
    - Extra labor
    - Power
    - Lighting
    - Heating
    - Wash water
    - Service water

LIST B

Suggested Data to Be Included on Daily Log Sheet

1. Rates of flow, raw and filtered (Venturi meter)
2. Basin gages
3. Turbidity, raw, settled, applied, filtered
4. Color, raw, filtered
5. Chemical rates......alum, iron, lime, soda, chlorine
6. Settings of chemical orifice or dry-feed machine
7. Solution tank gages
8. Weight of chlorine cylinders
9. Actual pounds of chemical used
10. Residual chlorine test of effluent
11. Filter units washed
12. Wash water used
13. Hours filters in service
14. Electric meter readings
15. Chemicals received into storage
16. Attendants on shift

Remarks

A New School of Citizenship and Public Affairs

A SCHOOL of Citizenship and Public Affairs will be opened next September in Syracuse University. It is to be an integral part of the College of Liberal Arts and Sciences, taking over the work of the Political Science Department and expanding it by the addition of new undergraduate and graduate courses.

The graduate work is to be offered in conjunction with the staff of the National Institute of Public Administration, which is cooperating in the organization and administration of the school. State Senator Frederick M. Davenport, member of the Political Science Department of Hamilton College, will serve as Advisory Counsel.

The purpose of the school is threefold: (1) to provide the whole student body with a broad and practical training in the duties of citizenship; (2) to prepare men and women for a career in public and civic administration, as, for instance, for that of technical assistant to city and state officials, of city manager, research worker in bureaus of municipal research, civic secretary and the like; and (3) to assist in training teachers of government and citizenship, both for the high schools and colleges.

Emphasis will be laid at every stage on first-hand contact with government in action. Research work will be featured and technical service rendered public officials through field surveys.

A special course covering a period of five years and looking toward a Master of Science degree is being planned. It will aim at the preparation of men and women for municipal administration. In the undergraduate period it will embrace a major in political science supplemented by courses from the following departments:

College of Liberal Arts
- Economics (elementary, public finance, statistics)
- History (American)
- Sociology
- Psychology
- Literature
- German or French
- Public Speaking
- Composition

College of Applied Science
- Chemistry
- Physics
- Surveying
- Roads, Streets and Pavements
- Water-Supply and Sewage
- Contracts and Specifications
- Materials Testing

College of Business Administration
- Elements of Accounting
- Office Management
- News Writing
- News Reporting

College of Law
- Municipal Corporations
- Business Law

The fifth year of this course will be devoted largely to a consideration of administration technique and municipal problems. It will cover the following subjects:

- Budgets
- Assessments
- Taxation
- Accounting
- Debt Administartion
- Personnel Management
- Public Health
- Police
- Fire
- Public Works Administration
- Purchasing

Further information can be obtained from the School of Citizenship and Public Affairs, Syracuse University, Syracuse, N. Y.

For Your Health Campaign

By Rosanne Amberson

Division of Publications, American Child Health Association

ON library walls, decorating business-like clinics and club-rooms, above the blackboards of industrious schoolrooms, as an effective border in gay nurseries, silhouettes of joyous, playing, children have made their appearance within the last few months. These decorative silhouettes, drawn by John Rae and issued by the American Child Health Association as a part of their health education material, seem destined to play an important inspirational part in child health movements all over the country.

When John Rae brought from his imagination a line of merry little children and turned them into black and white, he little realized what significance his picture children were soon to have. Planned first of all as illustrations for "The Runabouts in the House of Health," a recent preschool pamphlet of the American Child Health Association, the silhouettes immediately attracted attention. Their popularity influenced the Association to make them into wall runners—and as such they are now waiting to be used as part of your health campaign.

The future will expand the usefulness of the silhouettes in health projects. During their short two months of life their decorative and inspirational value has been their recommendation. They represent happy, joyous, health and are of importance to the mother, the teacher, the doctor or the nurse in making concrete the possibilities of such health. Each figure, with its appeal to the imagination, teaches health most pleasantly as it encourages children to weave a variety of stories and fancies. Associations and individuals all over New York, communities planning health campaigns in every part of the country, are even now adapting these posters to their own particular health needs.

These gay silhouette children are only part of a great mass of material issued by the Association for your health campaign. Merry little elves, with bobbing tasseled caps, carry baskets of eggs, brimming buckets of milk, steaming bowls of oatmeal, or handfuls of bright-colored fruit across four other decorative posters that make a strong appeal to children. Eight rules of the health game make up another poster which teachers have used successfully in their school health work.

And beside the posters, "The Healthland Flyer," a tourists' guide to Healthland with listed trains to the famous cities of Orange Valley, Drinkwater and Hot Soup Springs, has formed the basis of numerous health plays. A printed map of Healthland following the plan of the Flyer has been worked out concretely in tables of sand or with milk bottles and soup bowls and oranges, until Healthland has become a real country to the children. Study outlines for women's clubs, practical plan pamphlets for teachers, child care handbooks for parents—something designed to enlist the interest of every group in the community has been prepared by the American Child Health Association.

All this health education material possesses that inspirational quality which has made the silhouette posters so instantly successful. It is suggestive of devices and schemes, of plans and programs. It is designed for you and your health campaign.

Stream Pollution by Industrial Wastes, and Its Control

By J. Frederick Jackson

Director, Bureau of Engineering, Connecticut State Department of Health

REAMS of paper have been used in describing stream pollution, its evils and its remedies. Commissions and boards have been appointed, have investigated, and have compiled voluminous reports which repose forgotten, covered with dust, on the upper shelves of libraries or in vaults; and still, pollution in the aggregate continues to increase.

Under certain conditions in particular localities, as in England in the middle of the 19th century, some progress was made under the River Pollution Act authorizing the forming of Joint Committees or River Boards. In Germany, good work was accomplished in the Emscher Drainage District. The Chicago Drainage Districts have done much, and several states have, by special legislation, prevented the increase of pollution on certain badly contaminated rivers. But up to ten years ago, the sum total of private litigation to preserve riparian rights, investigation and reports of commissions, long and heated discussions in halls of legislatures, had not produced results at all commensurate with the time, energy and money expended on the problem. Why? Because the public as a whole did not appreciate the seriousness of the situation. All wastes, both human and industrial, were regarded as necessary evils that each one might get rid of as best he could. Where the municipality took care of the job, so much the better; and if one's neighbor's health or comfort was affected, that was their lookout.

In the middle of the 19th century, as stated above, public attention was directed to the serious aspect of stream pollution, particularly from industrial wastes, by the Royal Commission of Great Britain. Manufacturing in this period was on a much smaller scale. Very often the plants were located in villages on small streams distant from large cities. In his own district, the factory owner was often the local magistrate and exercised a very strong influence over his employees. Legislation restricting his acts in any way was looked upon as an unwarranted interference. He resented any curtailment of what he considered his rights. The sanitation of his own home was imperfect and that about his factories and the houses of his employees more so. This attitude has been a great obstacle to cleaning up the streams.

With the growth of the great industrial centers and the movement of manufacturing plants to them, the concentration of pollution became very much greater and the obstructing power of offenders gradually weaker. In this country, the size of the bodies of water, the expanse of territory and the agricultural pursuits of the people, the lack of organized form of government, all caused the pollution of the streams to increase unnoticed. We did not begin to realize that stream pollution was a problem for us until well into the 20th century. Then, the marvelous growth of our industrial centers, the increase in water-supplies, improved sanitation, and the general use of water-flushed plumbing fixtures so increased the pollution that necessity for curbing the use of the streams to dispose of raw domestic sewage was recognized.

Little was done, however, in controlling the discharge of industrial wastes. But, with the installation of water purification plants and sewage treatment works, many of which were affected adversely by industrial wastes; the increased use of the streams for boating and bathing; the growth of fish and game associations and their activities in conserving the fish life in rivers; but more than anything else, the concentration of pollution due to the extraordinary industrial growth of the country, focused attention on the necessity of limiting the pollution.

Beginning of Legislation

Stream pollution by industrial wastes then became the subject of much discussion and proposed legislation. In general, the people were divided into three groups: the manufacturers, who always had used the streams as they pleased, who considered them natural depositories for wastes, both human and industrial, and resented any control as an infringement of their rights and also as endangering the prosperity of the locality or country; those engaged in the shell-fish industry, sportsmen, men making a livelihood from fishing, who had watched the fish gradually disappear from the streams, and who wished all pollution stopped; and people interested directly in neither of these two groups, who, recognizing the seriousness of the situation, had been drawn into the discussion, but who felt that the solution lay in some middle course. The controversy has waged back and forth to the present day with sometimes one group in the ascendency, then the other. At the beginning, the first group was successful in preventing legislation with teeth in it; but recently, public opinion has become so strong for some remedial action that concessions to it had to be made.

The first step was comprehensive studies of streams and of the character of the polluting wastes in different sections of the country, by Federal and state agencies, sometimes, but not often, with financial assistance from municipalities and industries located on the streams.

These studies established the facts that, in general, all the wastes from industries pollute the streams; that certain kinds of waste were more detrimental than others; that the character of the stream and the use to which it was put were important factors in determining the intensity of the pollution and methods of eliminating it. In these studies, the streams are classified according to use as:

Streams used as a source of water-supply

Streams sustaining fish life or used in propagating shell-fish

Navigable streams used extensively by the shipping industry

Streams used for bathing, boating or other recreations

Streams the water of which is used in process of manufacturing

Wastes polluting streams used for water-supply are those from coal mining and washing, acid mine drainage, from gas and coal manufacture, metal pickling and galvanizing, chemical works, pulp mills, oil wells, oil refinery, wood distillation, sawmills, tanneries, textile mills, beet sugar, ore washings, tailings, munition plants, dye works, gluten settlers, leather-board plants, gravel-pit washings, and rice fields.

Practically all forms of industrial wastes destroy fish life, and the wastes from copper and brass mills are particularly injurious to shell-fish.

Wastes affecting shipping are solids which actually impede vessels, or which by settling obstruct the channels, and semi-solids or liquids which attack the hulls of vessels and the exposed metal of bridges, locks, etc., or because of their inflammable quality, menace shipping by fire.

Wastes affecting boating and bathing are those carrying large amounts of suspended matter or high acidity.

Wastes affecting water for use in manufacturing processes vary widely, depending on the character of the industry and the location on the stream. The wastes from a plant on the head waters of a stream might not affect one engaged in the same line lower down, but might be very detrimental to some other lines of manufacture.

In general, water used for boiler feed purposes must be free from wastes causing acidity or high in color or with excessive amounts of organic matter. Large amounts of suspended matter are not desirable in streams used by the copper, brass and steel industries. In the manufacture of silk and in bleacheries and dye works, a very pure water is necessary. Paper mills seek a water free from acidity, organic and suspended matter, color and salts of iron, calcium and magnesium.

Investigations and studies have demonstrated that it is possible to treat practically all industrial wastes in such a manner as to permit their discharge into the stream without detriment.

It is true that it has not been possible to do this for every class of waste in such a manner as to reclaim saleable by-products which would in part offset the cost of treatment. This has been the objective in many methods of treatment, because it was felt that greater progress could be made if it were possible to assure the manufacturer installing a certain method that there would be some return available to meet the cost of installation.

Too much time has been lost in many instances in striving to meet this requirement. However desirable it may be to establish and maintain harmonious relations with industries contributing pollution, we can delay no longer in applying the best known methods of treatment, imperfect though they may be, if we are to accomplish anything in the gigantic task of cleaning the streams of the country.

What Is a Clean Stream?

The criteria which apply to clean streams are: freedom from unsightliness, odors and disease-producing bacteria; and sufficient oxygen content so that the natural plant and animal life will not be destroyed. Solids cause stringy growths of green algae and the gray sewage fungi. Chemical reactions set in, which use up the oxygen. The beneficial plant life decreases, bacteria and animals causing putrefaction increase. Plenty of dilution or stabilized effluent is required.

The control of pollution must be vested in some central authority, either Federal, state, inter-state, district or municipal. Arguments for one or the other of these have, in turn, been advanced at different periods. Federal control is admittedly better for international waters like the Great Lakes and is strongly urged for the large inter-state rivers. Lately, opposition to Federal control has been apparent, and states, or, for interstate streams, groups of bordering states, have indicated a growing tendency to reserve the control to themselves. Legislation, heretofore, has placed the control of pollution in the state under departments or boards of health. The last few years have developed a strong trend toward placing it with other bodies called river, fish and game, sanitary water district boards, because it was claimed its effects relate more to the economic and esthetic than to the health side. Where the health department has been relieved of its power, it has been only in relation to industrial waste; control over domestic sewage from its recognized health effect has been left with them.

Divided Responsibility

This has generally led to divided responsibility, duplication of agencies performing the same character of work, and the slowing up, if not actual cessation, of constructive work in eliminating pollution. These objections have been met in some instances by giving the department of health representation on the commission. Two recent examples of this tendency are the River Pollution Board of Rhode Island and the Sanitary Water Board of Pennsylvania. The former, with limited personnel and small appropriation, has yet accomplished quite a little in removing pollution. The latter has outlined a very comprehensive program, classifying the streams from those in a state of pristine purity to those grossly polluted.

In many states, concentration of pollution, inadequacy of present laws to control it, antagonistic attitude of parties at interest and ill-advised attempts to block changes in laws were bringing about a situation where drastic legislation, non-enforceable in practice, was threatened. Wiser counsel or strong measures of restraint have headed this off for the time being, but it will crop out again unless definite steps are taken to enact some remedial legislation that can be easily enforced. As it is, the statute books have been cluttered up with too much legislation that was non-workable, and which no one cares very much to try to enforce and, consequently, it hurt rather than helped the cause.

What, then, is the best way to control pollution? The first thing necessary is to know the character of the stream and the character and amount of pollution; then to educate the public to the seriousness of the pollution and methods of removing it, and then get the parties at interest to agree on what central authority shall control it. Other things being equal, it will be wise to make use of existing agencies where they are organized to do the work, rather than to create new bodies, duplicating organization and adding expense. It would be, however, desirable to have all groups interested represented in a sort of joint board.

The Joint Committees or River Boards of Great Britain consist of from 20 to 30 members, elected by the councils of the municipalities, and representation on the Joint Committee is on the basis of the population of each municipality. They differ from the River Boards of Germany in that industries located on the stream are not given direct representation on the Board, though they have the privilege of electing one of their own group to the local council, which may choose him to represent it on the River Board. In operation, they are not confined by local political boundaries, their jurisdiction extending to the natural lines of the drainage area. In this country, we have nothing exactly similar, the trend being toward boards acting within the boundaries of a state, such as those in Rhode Island, Pennsylvania, and New Jersey.

In Pennsylvania, the Departments of Health, Fish and Game, Forests, and Public Service are represented, and the Attorney General is ex officio a member. They group the streams of the state into three classes: Class A, relatively clean and pure streams in which all artificial pollution is prohibited; Class B, streams in which pollution shall be controlled and where the control is determined by the use of the stream, the practicability of restoring it and the general interest of health, welfare and recreation; Class C, streams so polluted that practically it is not advisable to try to restore them to a clean condition.

It will be interesting to watch the work of this board, one of the first to attempt to establish a definite program of procedure. With between 4,000 to 5,000 streams in various states of cleanliness and pollution in Pennsylvania, the task of classifying them alone appears to be stupendous, and the possibilities for delay due to differences of opinion as to which class a stream might be placed in are very great.

Connecticut had a Joint Board composed of the Public Health Council and five other members, two of whom must be manufacturers and two experienced in sanitation. This board functioned for four years, when it was discontinued and its work summarily stopped. At the time of its sudden demise, it had succeeded in laying a broad foundation from investigation and experiment on which to build up a substantial piece of work in the elimination of stream pollution. Failure to realize that public opinion demanded some actual results in removing pollution rather than prolonged investigations, on one side, and lack of recognition of magnitude of the problem and progress which really had been made, on the other—neither side being willing to meet the other half-way—caused the work to be discontinued.

To my mind, while legislation that clearly defines different kinds of pollution and the responsibility for it are necessary in order to start the work right, there are other matters that are fully as important. Further investigation of character or degree of pollution, and additional experiments on treatment of wastes and river waters should be dropped temporarily, but a start should be made with the knowledge we have on one or two rivers, applying the methods which we know will at least improve their condition, leaving further investigations and experimental work to be developed as experience indicates best, as the work progresses.

There is no great industry but at some time in its history has seen methods and apparatus become obsolete and has not hesitated to replace them with better and improved ones, nor considered the money so expended, wasted. Of course, they were producing articles the sale of which in turn paid for the cost of the installation. This is one of the drawbacks to waste control and removal of stream pollution. We cannot express in dollars and cents the benefits derived from them. It is much easier to obtain appropriations for parks, highways, playgrounds, child welfare, etc., than for treatment of wastes and removal of pollution in streams where the benefits received are not so immediate or apparent.

One very necessary part of a successful program of removal of the pollution of streams is the character and composition of the board or central authority controlling it. It should be composed of men who are willing to sacrifice their time for the good of the state and are able to subordinate their personal feelings to the advancement of the cause. Such a board should meet frequently, and attendance should be compulsory. I have in mind a commission functioning somewhat as a circuit court, meeting in different parts of the state at set times and considering cases which have been assigned some time in advance.

This board should prepare a program having, as an objective, protection of health, navigability of streams, preservation of fish life and avoidance of nuisances. It should endeavor to obtain direct action, adopting simple methods of procedure, avoiding, in so far as possible, involved and too technical rulings, which provide excuses for delay, discourage public interest and weaken confidence in the work of the board.

Too complex a system of standards should be avoided. Definite standards are difficult to set and more difficult to maintain. Where attempted, they generally tried to correlate the dissolved oxygen and suspended solids or bacterial content, and as a rough measure of the pollution, they have considerable value. The experience of Connecticut, where the acid wastes so disturbed the normal equilibrium of the stream that dissolved oxygen as a criterion of pollution gave very erroneous results, shows the futility of adopting a standard to be applied to all streams of the country. Many investigators who have used the dissolved oxygen as a criterion, still maintain its general applicability, but as stream studies are extended, it will be recognized that, like other standards, it has its limitations. The B. Coli index for water-supplies, for example, while not furnishing positive evidence of a dangerous water, is the best we have to-day and we must use it where we can. A body acting in a judicial capacity, hearing evidence and weighing it carefully, handing down its decisions promptly and holding offenders undeviatingly to compliance with their orders, could in five years so change the conditions of the most badly polluted streams in any state that they would scarcely be recognized as the same bodies of water. It might not, probably would not, please everybody, but full perfection is never obtained in any state. It would have the confidence and support of the public and make a beginning which, if continued, would make the best known practice in removing stream pollution, the general practice, and this is the end desired.

Acknowledgment.—A paper read before the Sanitation and Engineering Division of the New England Health Institute.

Chamber of Commerce Activities in Public Affairs

San Francisco Chamber Organizes for Active Participation in Municipal Affairs

San Francisco, Calif.—Eight months' trial has demonstrated the value of a plan brought to fruition last September whereby the San Francisco Chamber of Commerce has placed itself in a position to function actively, intelligently and aggressively in municipal affairs.

It was recognized by the officials of the Chamber that the activities of a municipal affairs committee meeting only once a week at luncheon could serve only in an imperfect way to represent the business interest of the Chamber in municipal affairs. Experience has shown that such committees, valuable as their work may be, are largely restricted to those matters that are subjects of opinion and that, by the limitation of time and lack of technical services, they cannot go into the many questions of facts on which practically all municipal matters are based.

Since 1916, there has been operating in San Francisco a municipal research organization under the name of the San Francisco Bureau of Governmental Research. This organization has gradually built up for itself an enviable reputation as a citizens' agency, non-political and non-partisan in character, for the study of municipal affairs. It has secured a very large number of improvements by cooperating with officials. Its policy is definitely opposed to militancy in getting its recommendations adopted, except in major cases and as a last resort. It was decided by the Directors of the Chamber, in the interests of centralization and economy, that the Chamber should work through this organization, if possible, rather than to set up its own research organization, with danger of duplication.

Through negotiations between the Directors of the Chamber of Commerce and the Board of Trustees controlling the operations of the Bureau, it was arranged that the technical, full-time, paid staff of the Bureau, functioning through its Director, should serve as the staff and consulting agency for a municipal affairs committee of the Chamber. This being arranged for, a large Municipal Affairs Committee was formed, composed of over thirty members. This committee appointed as chairman a former supervisor in the city, whose name in itself carries considerable weight.

Immediately upon the formation of the committee, a Subcommittee on Initiative was appointed. This subcommittee reviewed all of the problems of the city and as a result proposed a program for the Municipal Affairs Committee and recommended also five subcommittees to handle the various features of the program. These subcommittees are: Charter Revision; General Government; Works and Development; Street Railway Transportation; and Water and Power.

The subcommittees have been actively engaged in the tasks assigned to them in November, 1923. Already they have justified their existence many times. When any question of major importance in municipal affairs comes up, they usually have anticipated the need for sound information and are able to report almost instantaneously to the Directors and to suggest a sound course of action.

The value of such service to a chamber of commerce cannot be overestimated. In San Francisco, with a municipal budget of $27,000,000 a year, with many projects proposed, the total of which would involve expenditures of nearly $300,000,000—with the city, in fact, the biggest business enterprise within the corporate limits—the necessity for the assumption by the Chamber of Commerce of leadership in these affairs is apparent. Through the Municipal Affairs Committee as organized, and with the staff service provided, the local Chamber feels that it has solved a long-standing and vexatious problem, in a very effective manner.

CHARLES A. SIMMONS,
Manager, San Francisco Chamber of Commerce.

Successful Work of Civic Sentinels

New Haven, Conn.—The Civic Sentinels Committee of the New Haven Chamber of Commerce has recently closed its first year. So far, membership in the Civic Sentinels organization has been confined to members of the civics classes of the Commercial High School, as it was desired to try out the plan with a limited number of high school pupils before extending it through the other schools of the city. The Civic Sentinels are junior guardians of the health and safety of the community. Each Sentinel is assigned one block and is required to report monthly on fire and health hazards, unsightly yards, and the condition of streets and sidewalks. In addition, the Sentinels are asked to attempt to have improper conditions corrected before reporting them to the Chamber.

The work for the first year has been so successful that the committee is planning its extension to the New Haven High School and the two Junior High Schools next year.

L. H. DUNCAN,
Assistant Secretary, New Haven Chamber of Commerce.

Street Flusher Convertible for Emergency Fire Fighting

Blytheville, Ark.—The Civic Affairs Committee of the Blytheville Chamber of Commerce has been instrumental in securing the purchase and operation by the city of a motorized street-flushing and sprinkling machine to replace a horse-drawn gravity sprinkler, privately owned, which was inadequate to care for the sprinkling of the commercial district. The new machine, a South Bend flusher and sprinkler manufactured by the Municipal Supply Company, mounted on a Mack truck, has been delivered to the Engineering Department of Blytheville and is now rendering excellent service.

STREET FLUSHER CONVERTIBLE FOR EMERGENCY FIRE FIGHTING

When the question of the purchase by the city of this piece of equipment was put before the City Council by the Civic Affairs Committee, the Council agreed to make the purchase provided that sufficient revenue to cover the initial cost and continued operation could be assured. The Committee, working with the City Engineer and members of the Council, then secured sufficient pledges from local citizens to justify the Council in making the expenditure. Under the present plan of operation, which calls for a charge to property owners of 12½ cents per front foot per month, the machine will pay for itself within two years.

In addition to flushing all streets within the commercial district of the city, the machine sprinkles in the residential districts. Auxiliary equipment has also been provided which makes the machine convertible into a fire engine for use in cases of emergency. This being done, the city now has at its disposal three fire-fighting trucks, all pumpers, two of which are American-LaFrance machines of the latest type.

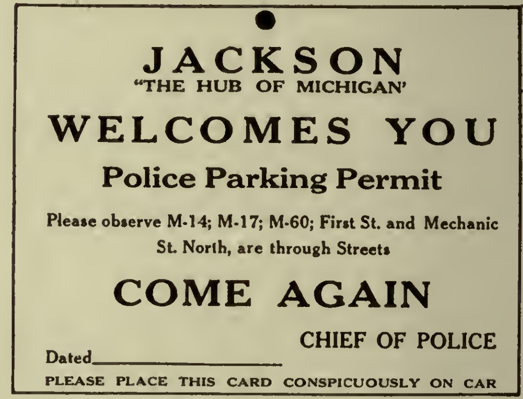
J. MELL BROOKS,
Secretary, Blytheville Chamber of Commerce.

Parking Permits for Tourists

JACKSON, MICH.—The card here reproduced, the original of which measures about 5 x 4 inches, has been authorized by the Police Department of Jackson for use on cars driven by people from outside of Jackson County. In the business section of the city a 60-minute parking limit is enforced for local automobilists, but it is desired to extend special courtesies to tourists and exempt them from local regulations. The cards may be obtained at Police Department Headquarters, from the Jackson Automobile Club, or from patrolmen on the beat.

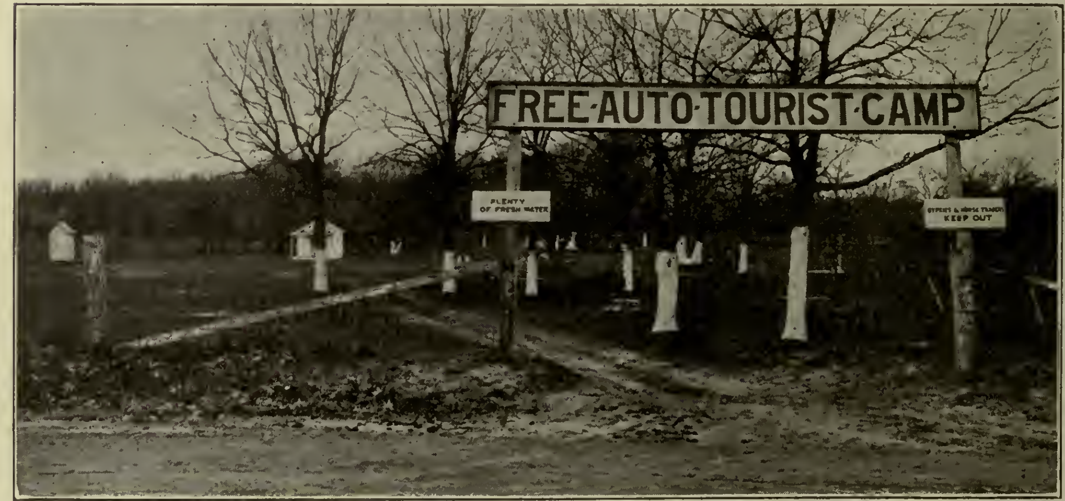
Prior to the adoption of this plan the idea had been discussed in committee meetings of the Chamber of Commerce, when both the City Manager and the Chief of Police were present.

EDWIN B. LINABURY,
Manager, Chamber of Commerce.


JACKSON
"THE HUB OF MICHIGAN'
WELCOMES YOU
Police Parking Permit
Please observe M-14; M-17; M-60; First St. and Mechanic St. North, are through Streets
COME AGAIN
CHIEF OF POLICE
Dated__________________
PLEASE PLACE THIS CARD CONSPICUOUSLY ON CAR

SPECIAL PARKING PERMIT, JACKSON, MICH.

For the Safety of Tourists Arriving at Night



IN THIS TOURIST CAMP AT BROOKFIELD, MO., THE TREES ARE COATED WITH WHITEWASH TO WARN TOURISTS ARRIVING AT NIGHT

Projects for Relief of Traffic Congestion in New York and Its Environs

A Summary of Causes of Congestion and of Important Specific Suggestions for Relief; from a Paper* on "The Highway Traffic Problem of New York and Its Environs," by Ernest P. Goodrich, Consulting Engineer, and Harold M. Lewis, Executive Engineer, of the Committee on Regional Plan of New York and Its Environs

Causes of Congestion

The causes of traffic congestion include:

(a) Narrow streets inherited from former times

(b) Building heights too great for the capacity of the adjacent streets

(c) The lack of zoning with reference to use, height and bulk of buildings, so as to preclude the creation of traffic congestion caused by the use of the streets by such building tenants, especially at morning, noon and evening hours

(d) The lack of platting ordinances which would prevent the creation of new subdivisions with streets which are too narow for their ultimate use

MOTOR VEHICLE REGISTRATION IN NEW YORK AND ITS ENVIRONS AND NUMBER OF PERSONS PER MOTOR-VEHICLE, 1916 TO 1923

	New York City			Environs			New York and Its Environs		
	Registration	Population	Persons Per Car	Registration	Population	Persons Per Car	Registration	Population	Persons Per Car
1916	116,858	5,280,000	45.2	123,492	3,076,000	24.9	240,350	8,356,000	34.8
1917	132,926	5,360,000	40.3	156,781	3,152,000	20.1	289,707	8,512,000	29.4
1918	146,395	5,440,000	37.1	169,520	3,228,000	19.1	315,915	8,668,000	27.4
1919	187,258*	5,530,000	29.5	217,529	3,294,000	15.1	404,787	8,824,000	21.8
1920	225,185	5,620,048	25.0	243,953	3,359,007	13.8	469,138	8,979,055	19.1
1921	266,099	5,740,000	21.6	296,204	3,394,000	11.5	562,303	9,134,000	16.3
1922	314,723	5,860,000	18.6	381,383	3,434,000	9.0	696,106	9,294,000	13.4
1923	371,003	5,980,000	16.1	480,801	3,479,000	7.2	851,804	9,459,000	11.1

* Estimated.

NOTE: Population figures for years other than 1920 are estimated.

(e) The inadequacy of arterial thoroughfares both present and proposed

(f) The lack of a comprehensive plan within which can be included each of the several creative and preventive measures suggested above

Summary of Some of the Most Important Specific Problems

The studies being made of the highway traffic problem in New York and its environs are not yet complete, but they have progressed far enough to give some indication of the most important specific projects which should receive very careful consideration. Many of these must be planned primarily by the local communities in which they occur, but all local plans should be related to a general plan of the whole region. The following list is offered as an indication of those which are being studied by the Committee on Regional Plan of New York and Its Environs, and as a suggestion to the various municipalities within the area.

A. ARTERIAL AND CIRCUMFERENTIAL SYSTEM FOR ENTIRE AREA

1. A by-pass route north of the congested part of Manhattan Island to connect New Jersey with the mainland of New York State east of the Hudson River
2. A new highway inland from the existing Shore Road in Monmouth County, to provide more direct access from Northern New Jersey to the shore resorts
3. The necessary legislation and adoption of a program to make possible the eventual development of a parkway route along the Morris Canal west of Paterson
4. A new route to provide better connection from Bridgeport and Norwalk to the Hudson River-Bear Mountain Bridge
5. The development of a parkway system west of the Hudson River, corresponding to that being developed by Westchester County on the east, which will connect the Palisades Interstate Park

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* The complete paper in pamphlet form (36 pages) can be secured by addressing Regional Plan of New York and Its Environs, 130 East 22d St., New York.

with the Essex County Parkway system via the Saddle and Passaic River valleys

B. EXITS AND ENTRANCES TO METROPOLITAN CENTER

1. Development of new arterial routes on the southern part of Long Island, which will help to relieve congestion on existing highways and provide connections with Brooklyn which will by-pass congested points in that borough and the borough of Queens
2. An additional general-traffic route parallel to the Boston Post Road between New Rochelle and Bridgeport
3. The adoption of a program which would provide for a future parkway route from Southern Westchester County to Bridgeport
4. A circumferential route from the proposed Hell Gate Bridge, borough of Queens, to the vicinity of Fort Hamilton, Brooklyn, by-passing congested districts and including Kings Highway
5. Extension of Riverside Drive to connect with existing roads in Yonkers, with a diagonal connection to the proposed Tibbetts Brook Parkway

C. BOROUGH OF MANHATTAN

1. Removal of obstructions in north and south avenues so as to increase their present capacity
2. Development of new routes along the Hudson and East River water-front for through traffic.
3. Development of a highway along the Manhattan side of the Harlem River to connect the north and south avenues and make them more available for through traffic

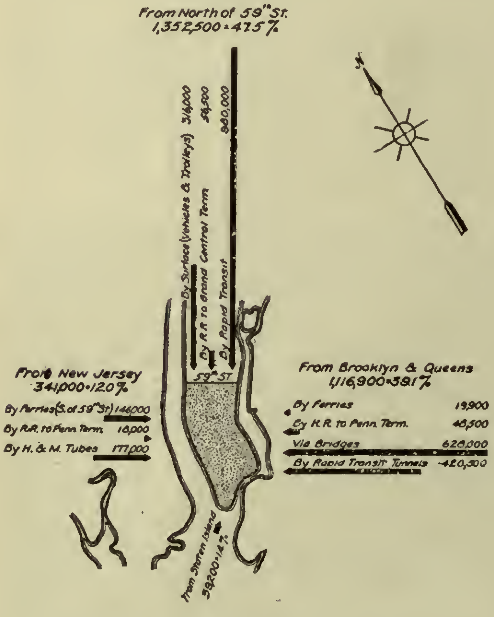


DIAGRAM
SHOWING
NUMBER OF PERSONS ENTERING
BOROUGH OF MANHATTAN SOUTH OF 59th STREET
DURING 24 HOURS
ON A
TYPICAL BUSINESS DAY - 1924
ESTIMATED TOTAL 2,849,600
SCALE OF PERSONS
0 300,000

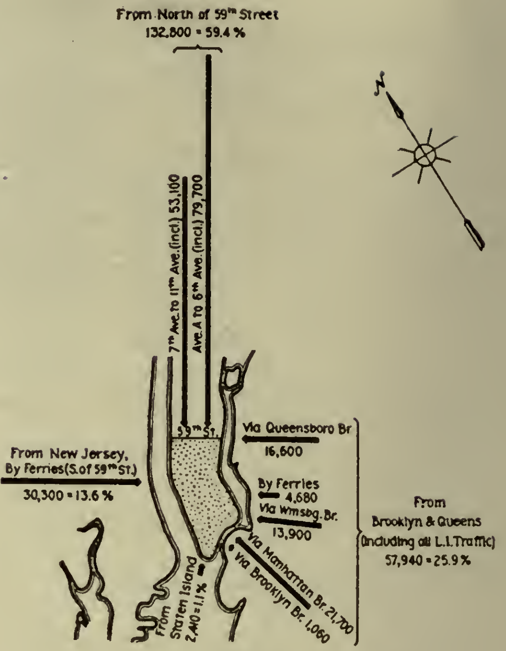


DIAGRAM
SHOWING
VEHICLES ENTERING
BOROUGH OF MANHATTAN - SOUTH OF 59TH STREET
DURING 24 HOURS,
ON A
TYPICAL BUSINESS DAY - 1924
ESTIMATED TOTAL VEHICLES 223,450
SCALE OF VEHICLES

How Regional Plan Committee Can Assist the Various Communities in Solving the Problem

It is not intended that this paper should, in itself, describe a definite solution of the highway traffic problem, but it is hoped that it will give some indication of the difficulties inherent in the problem, of the way in which it can be approached, of the necessity for dealing with the problem as a related part of the whole question of civic growth in a wide region, and of the part which the Committee on Regional Plan of New York and Its Environs can take in finding solutions. There are certain well-defined ways in which the staff of the Committee can most advantageously help and among these are the following:

1. By the continued collection of available data bearing directly upon the subject and by a study of those principles to be observed in the various and many details of the problem.
2. By making this information available as soon as possible for the various communities within the area in the hope that it may not only give them a realization of the difficulties to be overcome but may help them in the solving of their own local projects.
3. By helping to acquaint each of the communities with what is being done along these lines by their neighbors, not only so that they may profit by good examples, but so that the plans of each of them may be coordinated.

4. As an unofficial body planning primarily for the benefit of the entire area, it is hoped that impartial judgment may be brought to bear upon problems involving several communities with divergent views.

5. By showing the essential relationship between traffic, transit and transportation, and between these things and uses and bulk of buildings as part of the whole problem of distribution within the metropolitan area.

6. By careful study, and with the assistance of the best expert advice obtainable, to prepare a comprehensive regional plan which would include a proper system of highway development and an effective and practical solution for the ever increasing highway congestion.

$1,000,000 per Day Estimated Congestion Cost

The report says that while no exact figures are available as to the cost of traffic congestion within the New York Region, some idea of the probable losses may be secured by comparison with other communities where such estimates have been carefully made.

In Worcester, Mass., data showing the delay to vehicles in passing through the business district were prepared, from which the cost of congestion was estimated at $35,000 a day. In Cincinnati, a study of the speed at which vehicles could traverse the central business district indicated that approximately $100,000 a day was the loss from congestion. In Chicago, the cost of permitting cars to park within the Loop District has been estimated at $200,000 a day. After citing these investigations, the report adds: "Judged by the total amount of traffic in these various communities compared with New York, it would seem safe to estimate the cost of congestion in Manhattan Island at $500,000 per day, and the cost in the whole Region at approximately $1,000,000 a day."

First New York State Conference on Regional and City Planning

THE practical importance of extending city planning to embrace larger areas than municipal limits was given effective emphasis by the convening of the first New York State Conference on Regional and City Planning, held in Buffalo, June 9 and 10. To plan before the mischief has been done, to coordinate the plans of the large cities of the state, overwhelmed by problems of congestion and transportation, with the plans of the outlying districts, to deal comprehensively and humanly with the problems of the state growth were the underlying objects. It was the first time that private citizens representing small communities and large cities from every part of the state had met with each other and with officials and technical experts to discuss problems of planning.

An important accomplishment of the conference was the organization of a federation of planning agencies, called the New York State Federation of Planning Boards. The following officers were elected: President, Richmond Moot, of the Schenectady City Planning Commission; Vice-President, Peter D. Kiernan, Albany, member of the Commission of Housing and Regional Planning; Secretary-Treasurer, George Gove, New York City, Bureau of Housing and Regional Planning. In addition, seven executive members were elected: Harry J. March, of the Buffalo City Planning Committee; Edwin A. Fisher, of Rochester, Chairman of City Planning Section, American Society of Civil Engineers; Edwin Styring, of the Syracuse Planning, Parks and Recreation Commission; Egbert Bagg, of the Utica City Planning Commission; James G. Brennan, Albany, City Engineer; Charles W. Leavitt, New York City, Chairman, Committee on City and Suburban Planning, State Association of Real Estate Boards; Frederick A. Delano, Chairman, Plan of New York and Its Environs.

The human elements in city and regional planning were stressed by several of the speakers. Chauncey J. Hamlin, President of the Buffalo City Planning Association, said: "Planning does not engage my interest because it's a matter of business, of city development from the economic point of view; it appeals to me because of the human factors involved. We plan for people, not for things." Governor Smith, unable to be present in Buffalo, delivered his address to the delegates over the radio from the Executive Chambers in Albany. He said in part: "In the past we have approached the problems of city planning or state planning, in so far as we have approached them at all, as problems of industry. Our big cities have been developed as working places. Playgrounds are afterthoughts and always inadequate. It is as though man had been made to serve industry, and not industry to support man."

In his introductory speech, Clarence S. Stein, Chairman of the Commission of Housing and Regional Planning, emphasized the state-wide aspect of the new thought in planning. He said:

"But even the best of our city plans come to an end at the city limits. Evils that experience has taught us to prevent in the planning of our cities are growing up just outside these same cities—on land that is almost certain to become part of these cities. The city may have spent much energy and money on zoning, on the development of street and transit plans, on a park system. It may, after many bitter experiences, finally have coordinated its plan—only to find that the plan leads nowhere outside its gates. Its road system may be unrelated to the roads and street layout of surrounding development; its transit lines may be congested by the satellite towns; though it may have adequately protected itself with good water, sanitary and fire systems and building and housing codes against dangers to the health and safety of its citizens, these may all be endangered by the uncontrolled growth just outside the city limits. This is why we are beginning to talk about regional rather than city planning. Just as the individual house cannot stand by itself, but is dependent on the location of surrounding buildings for light, ventilation, privacy, sanitation and safety from fire, so in each region the various satellite towns and suburbs are dependent upon the city, and it in its turn is dependent on them.

"No city is master of its own destiny. It is dependent on the flow of food and material from other places, on transportation, on geographic influences. Industry is generally not fed locally; commerce is dependent on the outside world and the connections with the outside world. The health of communities is interdependent. The disposal of the sewage of one locality may affect the health of other localities. The smoke or odors from the industries that make one town successful may blight the growth of a near-by district—as Bayonne has injured northern Staten Island. The water-supply of one city may be rendered useless by the carelessness or neglect of its neighbors. Open country outside the political borders of a city may be the most desirable location for its larger playgrounds.

"The development in cooperation of facilities of common usefulness by a number of localities leads to numerous economies. But such can only be permanent if based on a plan that looks to future development."

The newly-organized State Federation of Planning Boards will begin its practical work immediately in connection with The Buffalo-Niagara Frontier Region. A meeting will be held in the near future of officials of the municipalities in and around the region to determine upon a unified plan for molding its future growth, in the common interest of all who live in that important section of the state.

Group Named to Organize Metropolitan Area for Detroit

PERMANENT organization of a metropolitan area for southeastern Michigan was agreed to as being very desirable when delegates, semi-official in character, from more than a score of cities and towns surrounding Detroit, met May 20 at the Detroit Board of Commerce. A committee of seven was selected by the delegates to effect a permanent organization.

In an article outlining the purpose of the proposed organization, *The Detroiter* says:

"Those attending last week's conference at the Board had been named as members of a permanent committee by the mayors and village presidents of communities adjacent to Detroit. This committee will organize itself and appoint subcommittees to draw up desirable legislation to be submitted to the next session of the State Legislature and to take up the financing of public projects through the agency of metropolitan areas authorized by such legislation.

"When the committee has satisfied itself on a plan, it is the intention to enlist state-wide support for it, so that the necessary authorization may be obtained from the State Legislature.

"Most of those present were particularly interested in finding a common solution for the problem of insuring an adequate water-supply in the future for their fast-growing communities, and for sewage disposal. Cities throughout the state are facing similar problems, and it is believed that the metropolitan idea, which retains to each community its political identity but provides for cooperation between several cities, villages, or townships, in building a common water plant or sewage disposal system, will meet with ready support.

"The communities nearer Detroit are also interested in the formation of port development districts and transportation districts. It is planned by the committee to draw up legislation which will enable communities to join together in forming metropolitan districts for such purposes as are of particular interest to them."

Helping Owners, Builders and Architects to Conform to Zoning and Building Ordinances

IN a pamphlet issued by the village of Lake Bluff, Ill., containing the text of its recently enacted zoning ordinance, a prominent page contains the following practical suggestions for the guidance of local owners, builders and architects:

"It is assumed that any property owner, contracting builder or architect intending to erect a residence, garage, apartment house or business building within the definitely zoned areas of the village of Lake Bluff purposes and intends to conform in all ways possible with the village standards and ideals, as well as complying with the strict letter of the law as interpreted in the various ordinances covering details of building, plumbing, drainage, etc.

"To make such conformity easy and simple, the following procedure is suggested:

"1. Employ a registered architect to prepare preliminary 'elevation' sketches of the proposed building.

"2. Submit these elevation sketches to the Village Clerk for the Plan Commision's approval as to architectural design.

"3. With the design approved, the architect and owner then proceed with confidence in the execution of detailed plans and specifications in harmony with the Village Building Code.

"The state law makes it compulsory to employ a registered architect for any structure costing $7,500 or more. The erection of any building of lesser cost will be found to be much cheaper in the end, and possible conflict with building and zoning requirements will likewise be avoided, by the employment of a registered architect.

"4. The plans and specifications thus prepared and approved bring (with the building license) a certificate of architectural approval by the Plan Commission, *which tells your neighbors you are working with and for the good of the community as a whole.*

"It is a generally recognized fact that building under standardized codes in definitely zoned territories puts back of your investment *permanent certainty of environment* that stabilizes values which increase and do not decrease with the passing years. Sound business judgment conforms and cooperates with these zoning and building standards, securing thereby protection for the future not possible in other ways."

Hard Water and Water Softening

By E. F. Badger
Chemical Engineer, Michigan Department of Health

MUCH interest has recently arisen in the question of hard water and methods of softening. The fact that the waters of Michigan are, for the most part, compared with waters in many sections of the United States, excessively hard, makes the problem of practical economic importance. Municipalities, manufacturers, industrial concerns and individuals are showing a growing appreciation of the financial waste due to hard water, and of the many advantages of employing some method of softening.

Water is considered hard when it possesses properties which require a large amount of soap to produce a lather. Hardness is a relative term and so there is no strict dividing line between a hard and a soft water. What might be considered a hard water in some parts of the country would be considered soft in other localities.

The hardness of water is due to certain mineral solids in solution. Calcium (lime) and magnesium (magnesia) salts are the principal compounds which cause hardness.

Effects of Hardness

The effects of hard water are quite generally known. The large quantities of soap necessary to produce a lather and the deposits which occur in teakettles are familiar to the housekeeper. The hard boiler scale formation is well known to men who operate steam plants. Aside from the large quantities of soap required by hard water, the greasy scum which is deposited by the soap on wash-bowls and bathtubs is very annoying and makes cleaning difficult. This scum also tends to clog the pores of the skin, preventing proper cleansing. The effects upon laundry work are very evident. The soap compounds (stearates of lime and magnesia) deposit in the pores of the cloth and make the clothes look dirty as well as having a tendency to rot them. Strong soaps and washing compounds are often used to overcome the hardness of water and these may contain substances which will finally ruin all but the toughest fabrics.

The disadvantages in the use of hard water for boiler purposes are many. These include the loss in labor, in repairs (a considerable item of loss when interruption of boiler service is considered), in fuel (more fuel is required when scale is present, and the loss of heat increases as the thickness of scale increases), and in the lessening of the life of the boiler (overheating at some points in the boiler because of varying thickness of scale will weaken it through the unequal expansion and contraction of the metal). This may also bring about deteriorations resulting in the explosion of the boiler. Hardness may also affect many industrial processes, particularly dyeing, bleaching and tanning.

Cost of Hard Water

Professor George C. Whipple of Harvard University, in his book, "The Value of Pure Water," gives a table showing the relation between the hardness of water and the amount of soap required to soften it. Professor Whipple states: "It was found that one pound of the average soap would soften 167 gallons of water which had a hardness of 20 parts per million. This is equivalent to about three tons of soap per million gallons. It was also found that for every increase of one part per million of hardness the cost of the soap increases $10 per million gallons of water completely softened."

Taking the figures of Professor Whipple, the cost of soap per million gallons equals 10 times the hardness in parts per million, which would make the cost of soap required to reduce the hardness of water having 100 parts per million, $1,000.

While it is true that only a relatively small proportion of the water used by a community is softened by soap, the cost of soap is nevertheless enormous to the community where hard water is used, when one considers that many Michigan waters contain 300 or more parts per million of hardness.

Some idea can be obtained of the cost to a community due to the necessity of the installation of cisterns and extra plumbing and the maintenance of this equipment.

Let us assume a municipality of 20,000 people and let us consider 5 to a family. If the water is as hard as 350 parts per million, the greater percentage of these 4,000 families will have cisterns. Taking a conservative figure of $200 for installation of a cistern and extra plumbing, and assuming that only one-half the number of families have cisterns, the initial cost to a community will be $400,000. Assuming that 10 per cent a year would cover depreciation, interest, and maintenance, this would mean an annual charge of $40,000 to a community, to which must be added the cost of extra soap used by those not having cisterns.

Cost of Water Softening

The cost of softening water depends upon many factors, but the cost of chemicals is one of the largest items of expense. The amount of chemicals necessary to secure the desired reduction in hardness will depend upon the chemical content of the water. The expense will be greater with a water having permanent hardness which must be removed than with one where temporary hardness removal will produce a satisfactory water. This is due to the difference in cost of lime and soda ash. the latter costing about three times as much as the former. The hardness of Michigan waters is largely temporary, and on that account relatively small amounts, if any, of soda ash will have to be used with many of our waters.

Grand Rapids, in the purification of Grand River water, uses lime for softening the water in conjunction with alum for water purification. For the year 1922 the average hardness for the river water was 218 and of the filtered water was 128 after the use on an average of 6.2 grains of lime to each gallon of water. The cost of lime, including freight charges, was $12.21 per ton, making the cost of lime for softening a little more than $5 per million gallons of water softened. In comparing the cost of water softening with lime and soda ash and with "Permutit," Charles P. Hoover states in the *Ohio Public Health Journal*, Ohio Board of Health, August, 1915: "At the Columbus water softening and purification plant during the year 1912 the hardness of Scioto River water was reduced from 222 parts per million to 79 parts per million. The cost of lime and soda necessary to accomplish this was $6.54 per million gallons, which would figure $4.57 per million gallons for the removal of 100 parts per million of hardness. The cost by the "Permutit" process for removing 100 parts per million of hardness would be $8.61." These "Permutit" figures are based upon experiments made by Mr. Hoover and are computed using the cost of salt at Columbus, which was at that time $3.50 a ton.

From these examples, some idea of the cost of chemicals for softening water can be gained.

Origin of Hardness

The sun is constantly evaporating large volumes of water from the surface of the earth. This evaporated water reappears on the land and water surfaces in the form of rain or snow. The part of the rain or snow which is not evaporated from the soil or taken up by the plant roots either flows over the ground to the nearest watercourse or percolates through the soil.

In its passage through the air, water acquires certain chemical constitutents which are present in the air. These include nitrogen, oxygen and carbonic acid. The amount of chemical constituents absorbed by the water in this manner is relatively small compared to that which it acquires in its passage through the soil and rock strata. Rain-water is therefore a soft water.

In its passage through the soil, water absorbs additional carbonic acid and traces of other acids from decaying vegetable matter and from the excretions of plant roots. This acidity which the water then possesses greatly increases its power to dissolve mineral substances. Again, in its passage through the soil the water loses much of the dissolved oxygen which it acquired in passing through the air and for this reason certain substances such as iron compounds, which would otherwise be oxidized and rendered insoluble, become soluble.

After passing through the soil and subsoil, the water comes in contact with various rock strata. These include limestone (calcium carbonate), dolemite (calcium and magnesium carbonate), sandstone and shales, as well as beds of chlorides of sodium (common salt), calcium and magnesium, and beds of calcium sulfate (gypsum). By reason of the carbonic acid in the water, the lime and magnesium carbonates of the limestone and dolemite go into solution in the form of bicarbonates. Water coming in contact with the chlorides and sulfates dissolves these substances also.

The hardness caused by the bicarbonates is called temporary, as these solids will precipitate or settle out on boiling in an open vessel or when the water is treated with hydrated lime. The hardness caused by sulfates and chlorides is called permanent. These will not precipitate out when water is boiled in an open vessel or by the addition of hydrated lime, but when boiled under pressure at a temperature of about 250° F., calcium sulfate becomes insoluble and will deposit as a hard scale upon the inside walls of the boiler especially when mixed with magnesia and silica.

Water Softening

Any method which removes calcium and magnesium salts from solution is called water softening. The most common method, and the one used by municipalities, is the lime-soda process. Hydrated lime and soda ash are used. The hydrated lime enters into a chemical reaction with the bicarbonates in the water, and compounds of calcium and magnesium settle out. There is one feature of this reaction which should be noted, namely, that the lime added to effect the precipitation of lime and magnesia is itself precipitated out if added in proper amounts. This explains why the addition of hydrated lime to the water to be treated does not increase its hardness but decreases it. As the sulfates and chlorides are not affected by the use of hydrated lime, some other substance must be added to remove the lime and magnesia from these compounds. Soda ash is used for this purpose.

With the use of soda ash the calcium and magnesium of the sulfates and chlorides become replaced by sodium, and the sodium compounds remain in solution while calcium and magnesium carbonates settle out. The sodium compounds do not produce hardness. In the softening of large volumes of water it is necessary to have a proper proportion and a thorough mixing of the chemicals with the water and also to have a proper time period for chemical reaction to take place. The temperature of the water is also an important factor in the operation. For many reasons no attempt is made to reduce the hardness by the lime-soda method below a certain point. With Michigan waters it is believed that a water with a residual hardness of 100 parts per million or slightly less after treatment will be generally satisfactory for domestic purposes.

Another method for softening water might be mentioned, as it is a method used particularly by some industrial concerns.

The process involves the use of natural or artificial zeolites (zeolites are complex silicates). The chemistry of softening with zeolites is based upon the exchange of the calcium and magnesium bases in the water with the sodium of the zeolite. After a time the sodium of the zeolite becomes exhausted and it is necessary to recharge or rejuvenate the zeolite. This is done by using common salt solution (generally 10 per cent solution sodium chloride) and allowing the brine to stand in contact with the spent zeolite. After rejuvenation of the zeolite, the excess brine is drawn off and the zeolite washed, thus making it again ready for use.

Zero hardness can be obtained by this method of softening, which makes it useful to adopt in many industries, particularly in laundries, textile mills and dye-works. Residences are often equipped with small water softeners, which appear under different trade names, such as "Permutit" and "Refinite." Many of these commercial softeners are of the zeolite type. The advantage of these installations is that cisterns and pumping equipment necessary for the use of rain-water can be done away with, as well as that the use of hard water for many household purposes can be avoided.

Conclusions

Some of the effects and the costs of hard water have been pointed out and figures have been given showing the cost of chemicals required to reduce 100 parts of hardness in water at Columbus and 90 parts in water at Grand Rapids. Examples have also been given showing the cost of soap and the approximate initial and yearly cost of maintaining cisterns and extra plumbing for rain-water where the municipal water is excessively hard. Another point which should be emphasized is the great cost to various industries in many ways by having hard water. Many municipalities should seriously consider the installation of a central water-softening plant. Such a plant would unquestionably effect a great saving to the citizens and the industries.

Acknowledgment.—Prepared from a paper in *Public Health*, published by the Michigan State Department of Health.

One Fire Each Year for Every Twenty-One Public Garages

FIRE losses in public garages and the causes of these losses are discussed in the leading article in *Safeguarding America Against Fire* for April, 1924. The extent of these losses throughout the United States is indicated by the following paragraph:

Reliable statistics place the number of public garages in the United States at exactly 49,156. From January 1, 1918, to December 31, 1922, fire losses occurred among them amounting to $19,677,593 on buildings and equipment and such stocks of accessories as customarily are carried by garages. This loss grew out of 11,519 separate claims for insurance. With an average number of claims per annum of 2,304 it will be noted that out of every twenty-one garages one suffers more or less severely from fire every year; or, to put it in another way, one public garage is, on the average, visited by the flames every three hours—a high ratio of burning, even in America.

Here is a problem which obviously needs more consideration than it is receiving from city councils and fire departments, as well as from the garage owners themselves.

Testing Rubber Street Pavement

Two Sections Laid at Heavy-Traffic Points in Boston to Determine Serviceability

NEW RUBBER BLOCK PAVING ON BRIDGE IN BOSTON, MASS.

THE first section of rubber street pavement in the East was laid on May 7 and the second section on May 14 on Northern Avenue, in Boston, Mass., near the center of the drawbridge, where it is estimated that the most severe horse-drawn vehicle and motor truck conditions exist. At this point approximately 1,000 vehicles pass each hour in each direction. The first rubber block was laid by Joseph A. Rourke, Commissioner of Public Works of Boston, the second block by Clarence Wright, President of the Wright Rubber Products Company, Racine, Wis., and the third block by Day Baker, Chairman of the Legislative Committee of the Massachusetts Automobile Dealer and Garage Association, who for the past three years has been urging the use of rubber for street and bridge pavement.

The rubber pavement laid on the Northern Avenue bridge consists of blocks 6 by 12 inches and 1 inch thick. The great difficulty in the way of the success of rubber block pavement has been the inability to keep the blocks down and to prevent them from creeping. Cementing to the foundation did not seem to accomplish the desired result. The Wright rubber paving blocks are constructed with two semicircular flaps on one side and one flap on one end of the base of the block, which fit into corresponding recesses in the base of the adjoining block. Spikes are driven through holes in the flaps into the bridge flooring, or the special device used for concrete road foundations. The blocks are laid in hot rubberized cement, uniting the blocks and holding them to the foundation, making a water-tight roadway over the street or bridge foundation.

The speed and accuracy with which this rubber pavement can be laid was exemplified by a crew of four bridge mechanics, a cement pourer, a cement layer, a paving block placer and a spiker, who laid the first hundred at a rate of 60 square feet per hour.

These sections of rubber pavement have shown no scratches or marks from horseshoe calks or the heavy steel tires of the drays using this bridge. As the horses and vehicles pass over the rubber-paved section, the lack of noise is at once appreciated, thus showing the desirability of this class of pavement for streets around hospitals, particular residences and high-class office buildings, as well as near schoolhouses.

Water-Works Improvements in Denver

THE Board of Water Commissioners of Denver, Colo., have assured the taxpayers that although the charter amendment and ordinance authorizing the 1923 series of municipal water bonds provided for a tax levy to pay interest and establish a sinking fund for retirement, the Board has obligated itself by resolution to pay both interest and principal from the earnings of the plant. The number of new taps for 1923 is 2,863, a gain of 24 over the number for 1922. The total number of taps on December 31, 1923, was 55,509.

Work has been started in relining the Ashland reservoir at a cost of $100,000. Plans are being prepared for the 66-inch conduit from Marston Lake to West Alameda and Federal Boulevard, and contracts have been let for the construction of a 66-inch Douglas fir-stave raw-water conduit from Kassler to Marston Lake, a distance of more than 10 miles. Contracts let for this work totaled $760,842.59. A contract has also been let for the construction of 20,330 feet of 54-inch reinforced concrete conduit from Massey Hill to Wynetka at a total cost of $416,765. This is a continuation of the line built two years ago from the filter beds at Kassler to Massey Hill and when completed will carry 50,000,000 gallons per day and replace the old wood lines Nos. 1 and 3, which have ceased to be serviceable. Nearly one million dollars has been spent on new equipment.

Building Public Works by Force Account

A Review of the Experience of Dayton, Ohio, Published in the *Dayton Municipal Review*

By Ivan E. Houk

Formerly City Engineer, Dayton, Ohio

THE experience of Dayton, Ohio, in building public works by force account has shown that such methods are often, though not always, advisable. In general, such methods have been found economical in times of unemployment, when first-class foremen and efficient labor are plentiful at reasonable prices; in cases of comparatively small jobs of ordinary nature where the costs of organization and preliminary preparations are relatively large proportions of the total cost; at times when the city has idle equipment suited to the work in question; and in instances where the contractors have combined with the intention of controlling construction costs.

Force account methods have certain advantages over contract methods. Probably the most important of these are the possibilities of starting the work before the plans are completed, and of making changes in the plans as the work progresses without the necessity of being called upon to combat unreasonable claims for extras. Nevertheless, it cannot be denied that contract methods sometimes have certain advantages over force account methods. For instance, contractors do sometimes evade the eight-hour law where municipalities cannot. In the summer of 1923, when considerable construction work was under way in Dayton, the city had trouble in securing satisfactory common labor, because the best men preferred to work for contractors where they could put in ten hours a day rather than eight. Then again, private companies are not hampered by governmental "red tape" as municipalities are. Conditions regarding availability of suitable equipment may be reversed. Contractors may have idle machinery adapted to the work in question when the city-owned equipment is busy, or when the city does not own suitable equipment. The contractors may be short of work and anxious to secure contracts in order to keep their organizations together. On such occasions Dayton has awarded grading jobs at rock-bottom prices—prices which could not possibly have been lowered by force account methods.

Since the adoption of the commission-manager form of government, which followed shortly after the 1913 flood, considerable work has been done by force account methods. In the city's charter are sections which give to the Director of Public Service the right, subject to the approval of the City Commission and to the conditions laid down by ordinance, to construct public works by the direct purchase of supplies and materials and the direct employment of labor, or, in other words, by force account. During recent years this right has been exercised whenever and wherever the character of the work or the existing labor and contract conditions showed such procedure to be justified. Of the million-and-a-half-dollars' worth of work executed in 1922 and 1923, approximately 25 per cent was carried on by force account. Since the close of the World War, practically all the new sewer installations have been made by force account, because the contractors, apparently in a combined effort to maintain high construction costs, refused to submit bids within the engineer's estimates after the estimates had been reduced in accordance with the reductions in labor and material prices. In addition to the sewer work, which included the building of two sanitary relief sewer-mains, the force account activities during the last two years included a considerable amount of street pavement resurfacing with sheet asphalt; the laying of some sheet asphalt surfaces on new pavements, the bases of which had been built by contract; the laying of some new brick pavements; the construction of a few reinforced concrete culverts in the old Miami and Erie Canal; and the building of the foundation structure for a new sewage pumping-station.

Examples of Force Account Construction

A good part of the above-mentioned improvements was begun in the fall of 1921 and carried on during the following winter months when the unemployment situation was worst, primarily with the view of providing work for the needy, believing it better policy to provide work than charity. It developed, however, in the case of culverts especially, that considerable money could be saved the taxpayers by doing the work at that time. For instance, construction companies, because of the lack of work, were glad to lend the city their best foremen at their regular straight-time rates. They were also glad to rent their equipment to the city at reasonable prices. Sufficient and efficient first-class common labor was obtained at fair prices, and common labor at 35 cents an hour was used in placing the steel. Consequently, the city was able to build culverts at approximately two-thirds of the estimated costs. The Stewart Street Culvert, near the National Cash Register plant, which may be mentioned as a typical case, was built at a total cost of $12,359.84, a saving of $6,787.08 over the original estimate of $19,146.92. Of course, we have no way of knowing what the cost would have been if the job had been done by contract, since the work was not advertised for bids. It is pretty safe to assume, however, that the contract cost would have exceeded the actual cost. In 1919 the Germantown sewage pumping-station was built at a total cost of $13,687.70, by force account, including machinery and equipment, a saving of $6,500 over the engineer's estimate. This job had been advertised several times, and the bids received varied from $32,000 to $36,000.

While the sewers were built at costs within the estimates in practically all cases, the savings in the work done during the unemployment crisis were not so great as in the case of the culverts, or as in the case of the earlier or more recent sewer work. There were two causes primarily responsible for this, both of which hinged on the labor situation. One was that in order to furnish some work to as many men as possible, new gangs were put on each week, keeping only a few of the best men on each job to serve as a nucleus for the new gang. Thus the foremen were handicapped in a way, in that they were continuously breaking in new men. About the time the men became accustomed to the job so that they could work efficiently, they were laid off and new men put on in their places. The other cause was that practically all of the work was done by hand instead of by machinery—even the mixing of the concrete in some instances. In the more recent sewer work, as well as in that carried on before the business depression, when labor was scarce instead of plentiful, Keystone diggers, trenching machines, concrete mixers and other types of machinery were used whenever possible. Consequently, the costs were kept proportionately smaller and the savings over the estimates made correspondingly larger. In 1921 the city laid 7,322.3 lineal feet of storm sewer, by force account, at a total cost of $30,646.88, a figure $9,462.81 less than the engineer's estimates. Included in this total was the Brooklyn Avenue sewer, which was advertised for bids to be opened February 14, and for which no bids were received. It was built by force account at a cost of $14,821.90, a saving of $2,682.60 over the estimate. Many similar cases might be mentioned.

In the case of the sewer work, competition among foremen, as well as full information regarding the progress on the various jobs, and, consequently, knowledge regarding the abilities and efficiencies of the foremen, was obtained by a system of weekly reports. These were prepared by the engineer in charge of the sewer work, and showed the total amount of work completed to date, the estimated cost of it, the actual cost, and the accumulated balance or deficit. When the time came to reduce forces, these reports furnished a conclusive basis for action.

Minor sewer installations, such as are being continually required in cities of appreciable size, constitute a class of work which probably should be done by force account in all instances. These jobs are really of a maintenance nature, and should be handled by sewer gangs, organized and operated in much the same manner as the maintenance crews. Similar gangs may be kept busy on the larger sewer jobs, as has been done in Dayton during the last few years; but there may be many instances where it is more advisable to do such work by contract. Minor street paving jobs might also be economically handled by force account methods, especially those of sheet asphalt construction. Most cities of appreciable size own asphalt plants for use in repair work, whereas paving contractors, unless they are specializing in asphalt work, seldom own such equipment. The plants and crews used on the municipal repair work may also be used on new construction.

Dayton began resurfacing her worn-out brick pavements with sheet asphalt about four years ago, doing the work by force account and using the asphalt repair gangs during spare times. Streets carrying car-tracks were resurfaced on the shoulders with courses varying from 0 to about an inch in thickness, averaging about half an inch, at a cost of about 49 cents a square yard, exclusive of overhead. Other streets were resurfaced with courses varying from 0 to 3 inches in depth, averaging about 2 inches, at a cost of about 85 cents a square yard, exclusive of overhead. No work of this nature was done by contract; consequently, no direct comparison of costs by the two methods is possible. However, a few 3-inch courses, on new pavements, the basis of which had been laid by contract, were laid at a cost slightly less than $1.40 a square yard, exclusive of overhead, at a time when asphalt paving companies were getting $1.90 for similar work. Of course, the latter figure had to cover overhead as well as other charges. These jobs were not advertised for bids, because they were too small to warrant the bringing of a plant to Dayton. Dayton's asphalt work has been handicapped in the past by the limitations of the plant, a rather ancient type with a capacity of only about 500 yards a day. A new plant, with a capacity of 1,250 yards a day, was purchased last year, so that better work can be done in the future.

Thus far, Dayton has not found it necessary or advisable to do much new street improvement work by force account; except, of course, the comparatively small jobs, which, like the sewer installations, are really of a maintenance nature, and can be handled by the maintenance crews. Satisfactory competitive bidding, resulting in fair contract prices, has usually been obtained in the case of new street work. Force account methods have been used in a few instances where the legislation, started during the period of rising prices, did not provide sufficient funds. In such cases it was considered better policy to do the work by force account rather than by contract. Force account methods were also used in a few instances after the war, on jobs from which no bids could be obtained. Klee Court, a small brick paving job, the cost of which has been estimated at $12,463.50, in April, 1918, was paved by force account in the fall of 1921, at a cost of $9,625.18, a saving of $2,837.82, or about 23 per cent of the estimate. A part of this saving, however, probably about $800, was due to laying the brick flatwise instead of 4 inches deep, as it is generally laid in Dayton. This job was advertised in the spring of 1919, but no bids were received. Of course, there was a considerable reduction in costs between the spring of 1919 and the fall of 1921.

Force account work in Dayton has not, thus far, been hampered by civil service regulations. While the Civil Service Commission has the authority, under the charter, to supervise the employment of all classes of day labor, the members of the Commission, in their willingness to cooperate with the other divisions of the city government to the end that the construction work be prosecuted most economically, have not rigidly exercised this authority. They have felt, as have also the engineers, that as far as common labor is concerned, the hiring, and especially the firing, had better be handled entirely by the foremen on the jobs.

There are also, undoubtedly, times when reliable contractors are exceedingly anxious for work; times when they will bid rock-bottom prices in order to obtain it. As long as private jobs are done by contract, we shall have contractors; and as long as we have contractors, there will be times when they are unusually anxious for work. Such times are good times to advertise work.

Applicability

Each job of appreciable magnitude should be studied individually, and all the various affecting conditions given proper consideration before deciding which method to use. Probably more public work should be constructed by force account in the future than has been so built in the past. The increase in such activities, however, should be made when and where careful business judgment shows such procedure to be justified, not merely based on a general recommendation that such methods be used in public works construction. As far as municipalities are concerned at the present time, it is only on the comparatively small jobs of ordinary nature, such as the small sewer and paving jobs, which are really maintenance matters and which can be handled by the maintenance crews in connection with their routine work, that force account methods can be considered invariably advisable.

Dust-Laying in Fitchburg, Mass.

DUST-LAYING in Fitchburg, Mass., in the last four years has been with oil instead of water, and as no complaint has been received from taxpayers or property owners because of the change, it has been assumed that the results, so far as the abutters are concerned, is at least as satisfactory as when water was used. The use of oil instead of water has been of great assistance in keeping the earth and gravel streets in good condition, according to David A. Hartwell, Commissioner of Public Works. Oil is not used on paved or macadam streets, but special effort is made to keep such streets so clean that no complaint will be occasioned by dust when the wind velocity is great. The quantity of oil used in 1922, the last year for which a report is available, was 12 tank cars containing 116,558 gallons. The price paid was $0.051 per gallon, which was the lowest price paid in any recent year.

Forward Steps in City and County

County Board of Education Busses Operated by High School Students

Birmingham, Ala.—In building up the system of consolidated rural schools now successfully established in Jefferson County, the County Board of Education has recognized the importance of providing adequate transportation facilities for the pupils.

When the program of consolidated schools was undertaken in this county several years ago, the first step was the construction and equipment of schools of modern type, giving the children of the rural districts advantages in public school education equal to those offered by the cities. The next step was to arrange for the free transportation of the children to and from school. This was at first handled by letting contracts to outside parties, but it was later decided to purchase and operate our own busses. Experience has proved this method to be a much more satisfactory one, in that we can at any time change the bus routes and increase or decrease the bus service as necessity demands, without trouble or extra expense.

When the resolution was made by the Board of Education to own and operate its own busses, a fleet of twenty-five White busses, Model 15, were acquired. They have proved very economical and reliable; we have had practically no tardy pupils among those who use them.

At the present time about 900 children are transported daily in this county, and in order to do this some busses are required to make two trips daily. The drivers are selected from the high school male students recommended by the school superintendents. They are paid a small monthly salary for this service, and they are very anxious to make good. The parents of the children are more than pleased with the system, and many requests have been received for more busses operated by the Board of Education in sections where some of the routes are still operated by contractors.

The saving effected by the elimination of contract charges for bus transportation will, it is believed, cover the cost of the busses within a period of four or five years, and the machines will still be fit for many more years of service.

R. G. HEWITT,
Chief Clerk, Jefferson County Board of Education.

Studying the Requirements of a Municipal Transportation System

Rockford, Ill.—On December 23, 1923, a resolution was adopted by the City Council of Rockford, instructing the Mayor to appoint a special committee consisting of himself and four others, to investigate and prepare a proposal for a publicly operated transportation system, and stipulating that a complete report of said committee should be submitted to the City Council before any action would be taken in a twenty-year franchise ordinance then pending to the local traction company.

The report of this committee was published in May, 1924, in pamphlet form and is available for any reader of The American City who may request a copy. It contains information gathered by the committee regarding the transportation systems in forty-seven cities of from 40,000 to 100,000 population. The conclusions of the committee, so far as the local situation is concerned, are as follows:

"Your committee is willing to grant that cities having an efficient street railway system are as well off as they could be with an exclusive bus system, but cities which, like Rockford, lack an up-to-date street railway system, could make no mistake in insisting upon a change. We hold that a contract between a city and a private utility should be as binding and sacred as a contract between men. This condition has not prevailed in the past. That has been one of our most difficult problems, when as a matter of fact it should have

ONE OF THE CONSOLIDATED RURAL SCHOOLS IN JEFFERSON COUNTY, ALA., SHOWING PART OF THE FLEET OF MOTOR BUSSES USED FOR TRANSPORTING SCHOOL CHILDREN been no problem at all. When contracts with corporations or individuals are broken, means may be found whereby they may be enforced. Such has not been the case in connection with the operation of privately owned public utilities, and until such time as our Legislature sees fit to enact such laws as will permit the cities of the state to settle its own difficulties and to solve its own problems, then the only means of protection that we have left is to refuse to become a party to long-term franchises.

"Concerning municipal ownership and operation of the transportation system, or the leasing thereof, your committee would report that no lease be considered, and that the matter of a municipally owned system be investigated further. Your committee feels, however, that municipal ownership is the only means of solving the transportation problem, but that the time is not yet ripe for embarking upon such an undertaking, for the following reason:

"That the present state laws are detrimental to the successful and practical financing and operation of such an activity. Further, we feel it would be a mistake to take over the company's property in its present condition.

"Your committee is convinced that the public would loyally support a municipal transportation system, this in view of the fact that every citizen would be a partner in the enterprise and consequently a booster for its success instead of being hostile to the utility as is the case at this time. We hold that what is of necessity a monopoly, should be a public monopoly, and operated solely for public convenience and service.

J. H. HALLSTROM, Mayor.

Milk Must Be Served in Individual Containers in Chicago

CHICAGO, ILL.—In accordance with an order recently issued by the Department of Health of Chicago, all milk sold to the public by restaurants and other eating-places in this city must be served to the patrons from the original containers, bottles, or receptacles of a similar character, instead of dipping, pouring or serving from ordinary urns as heretofore. One exception to this rule has been made, however, in the case of certain large restaurateurs who have been permitted to dispense milk with the aid of certain appliances that result in milk of the proper butter-fat content when served and that permit of being easily cleaned.

The Department of Health has for several years been collecting samples of milk as served in glasses to patrons of eating-places, and in tests made during the past year in the Department's laboratory it was found that every third glass of milk sold in the city was below the standard butter-fat content of 3 per cent, which was in violation of the Chicago ordinance. After a thorough investigation of the situation in this city, and a study of the methods in practice in twelve of the largest cities of the United States as set forth in replies to a questionnaire sent out to health departments of these cities, it was decided to enforce this order prohibiting the dispensing of milk through ordinary urns, pouring cans, etc., and the skimming of cream from milk before it is sold. Therefore, milk is now being sold in individual half-pint bottles or by means of specially constructed urns. In soda fountains where malted milk is sold, the milk is handled in quart bottles.

The proprietors of various establishments with whom the Department has conferred regarding the matter, have offered their cooperation, and it is believed that within a very short time milk of legal butter-fat content and bacteriologic standard will be sold throughout the city.

HERMAN N. BUNDESEN, M. D.,
Commissioner of Health.

County Firemen's Association Conducts Fire Prevention Contest

OXFORD, N. Y.—To awaken an interest in the need for fire prevention in Chenango County, and especially on the part of the farmers and small-town inhabitants who suffer the greatest loss from fire in this section, the Chenango County Firemen's Association recently conducted a fire prevention essay contest among the public school pupils of the county. The contestants were divided into three groups—pupils in high schools, in grades below the high school, and in district schools, and a first prize of $10 and a second prize of $5 were awarded to the winners in each group.

To assist the pupils in the preparation of their essays, arrangements were made by the Association to furnish speakers on the subject of fire prevention to any school in the county upon application. In announcing the rules for the contest, the committee in charge stated that the essays would be judged primarily from the standpoint of the practical suggestions offered for the prevention of fires in homes, premises, schools and churches. From the papers submitted it was apparent that the pupils had devoted a great deal of time and thought to the subject, and it is expected that this effort on the part of the Association will result in a noteworthy reduction in the fire loss in Chenango County this year.

FIRST PRIZE ESSAY IN THE HIGH SCHOOL GROUP

(By Fanny E. Nelson, Smithville Union School)

The need for better fire prevention is increasing daily. Each year finds more property destroyed and more lives lost by fire. The chief causes are carelessness and neglect.

Fires in the community could be decreased by the installation of electricity, properly wired. Precautions taken in each home, store, and public building play a large part in fire prevention. The most common causes are chimneys and stove-pipes. These become dirty and defective and are neglected. Those which are not used during the summer should be inspected and cleaned before a fire is started. Stoves should be placed at least two feet from the wall; if not, tin or asbestos should be put behind them. Furnaces should be surrounded on all sides, except the front, by tin and should not come directly under stairways or near anything combustible. Rubbish should be burned at some distance from buildings, on the opposite side from which the wind blows. Smoking in barns and garages should be forbidden, for the oil and chaff are easily inflammable. Lightning rods are a sure protection against lightning, if properly wired; otherwise they serve only to draw electricity. Some examples of carelessness in the home are as follows: the dumping of ashes in wooden boxes; drying things too near the stove; placing matches where children and mice can reach them; and the burning of candles on Christmas trees, in windows, and on tables.

Some means of saving life and property in the community are: a fire district with a fire company and equipment; fire escapes on public buildings of more than one story; fire drill in schools; fire extinguishers in all buildings; lightning arrestors on telephones; more than one exit to public buildings; wire fences not attached to buildings; and avoiding the storing of combustible things, gasoline, wet hay and grain, and the like, in barns.

If fire prevention was practiced in all homes and communities, expenses would be lessened and lives saved.

SAMUEL S. HALE,
Chairman, Committee on Fire Prevention Essay Contest, Chenango County Firemen's Association.

Shreveport Recreation Department Has Developed Rapidly

Shreveport, La.—In the summer of 1921, several public-spirited citizens who were interested in the development of recreation in Shreveport invited Community Service, which is supported by the Playground and Recreation Association of America, to send them a special organizer to set up a local organization. As a result of the organizer's efforts, the local organization started a recreation program on a public subscription basis, having a budget of approximately $4,000 a year. After two years of work on a public subscription basis, the present City Administration took over the work and established a permanent Department of Recreation, and is providing it with adequate funds to carry on a city-wide program of recreational activities.

In 1923, two neighborhood playgrounds were opened to the public, and during this year at least three others will be put in use. These playgrounds will be equipped with apparatus suitable for children, wading pools, shelter houses, tennis courts, etc., and will be under the supervision of trained directors. The very best material available is going into all our playgrounds and parks.

Our major athletics consist of baseball, basketball, volley-ball, tennis and golf. In 1923 we had one of the best commercial and industrial baseball leagues in the South. Our tennis tournament attracted state-wide attention. The Municipal Basket Ball League, which has just closed its activities, was composed of 19 teams of working men and women, with a membership of about 380 people. Approximately 300 games were played in the Coliseum, which had been lying idle heretofore, and which was converted into one of the best gymnasiums in the South. These games were witnessed by approximately 14,000 people.

A splendid municipal golf course was opened to the public on May 1.

A BASKET-BALL GAME IN THE COLISEUM IN SHREVEPORT, LA.

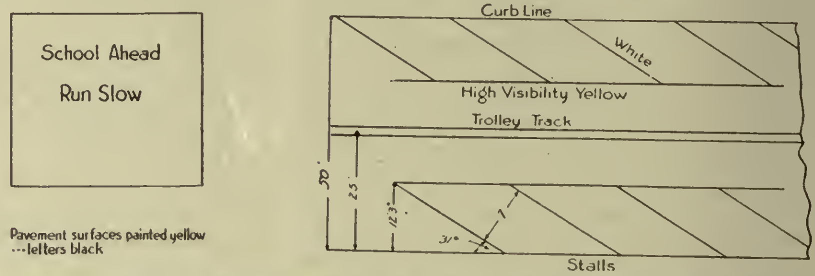
Our municipal band will give concerts in the parks and playgrounds during the summer. These concerts last year were enjoyed by thousands of people. We have added free motion picture shows to these concerts this year.

Our next big project will be a municipal swimming pool. Plans for such a pool are being perfected, and we hope to have it in operation by the middle of the summer.

GROVER C. THAMES,
Supervisor of Recreation.

Yellow vs. White for Traffic Lines

Coatesville, Pa.—This city is one of the first in the United States to experiment in the use of High-Visibility Yellow Paint instead of white paint for marking traffic lines. The scheme illustrated in the accompanying sketch is now being tried out on that section of the Lincoln Highway which runs through the main business district of Coatesville. This street is 50 feet wide between curbs, with a street-car line in the center. Here it is necessary to accommodate the large number of cars used by residents of surrounding rural communities who make this city their shopping center, and who do not wish to be shunted to side streets for parking. While a few complaints have been received from owners of large cars who claim that the parking space allowed is not sufficiently long for their cars, the plan on the whole is working out most satisfactorily.



SCHOOL SIGN ON PAVEMENT, AND TRAFFIC LINES, COATESVILLE, PA.

The paint is the product of the Tropical Paint and Oil Co., of Cleveland, Ohio, and is applied by an A. B. C. traffic line marker made by the Highway Appliance Co. of Providence, R. I. It was decided to use the High-Visibility Yellow Paint for outlines and white paint for parking spaces. The results so far have proved the wisdom of our choice. The yellow lines stand out much more clearly than the white after dark and also after the streets have been cleaned and washed. At street intersections the traffic marking has been done in white, but we are planning to use the yellow paint at an intersection which is soon to be marked, in an effort to determine which color is the better one for this particular purpose. On school streets we propose using a yellow background with black lettering, as shown on the sketch.

GEORGE ROMMEL, Jr.
City Engineer.

The Modern Water-Works of Buenos Aires, Argentina

By J. W. Ledoux

Consulting Engineer, Philadelphia, Pa.

BUENOS AIRES, Argentina, South America, has grown from a city of 158,000 in 1869 to a metropolis of 1,929,000 in 1924. As it stands to-day, the supply system of the water-works is located in two places, about two miles apart, one called Recoleta and the other Palermo. Recoleta was the original works, and some of the early vertical pumping-engines, installed in 1854, are still in operation and functioning satisfactorily. While the city intends eventually to abandon these works, it will in all probability retain the old pumping-engines. At the present time the filters located there are of the slow sand type, and there is also a plant for manufacturing sulphate of alumina. This is put into solution and sent by gravity through pipes to the Palermo plant, where the rapid sand filters are located. The Palermo works are up to date in every respect and contain high-duty pumping-engines of the vertical triple-expansion condensing type.

AVERAGE CONSUMPTION OF WATER IN BUENOS AIRES, ARGENTINA

	Gallons per Day	Gallons per Capita per Day
1899	26,400,000	33
1909	41,800,000	33
1919	103,000,000	62
1923 (estimated)	140,000,000	72

A visit to these two plants would surprise an American engineer familiar with the best types of pumping-plants in the largest cities of the United States. The water-works buildings are well designed, according to the best European architectural standards, and the landscape gardening surrounding the station is far above that to which we are accustomed in the United States. They have a very elaborate and complete laboratory for all kinds of testing and employ a large number of chemists, biologists and physicists.

While there are slow sand filters at the Palermo works, these are being done away with as fast as possible and mechanical gravity filters are being substituted for them, in larger units than are customary in the United States, being about 8,000,000 gallons per day.

The water-supply of Buenos Aires comes from the Rio de la Plata, which at the intake point is about 80 miles wide and has a watershed of about 1,660,000 square miles. The water is, of course, tidal, but on account of the great volume of the river it is always fresh, although generally quite turbid.

The city of Buenos Aires is flat and the elevation some 50 feet above tide-water, so that to provide sufficient pressure for the ordinary uses of the city consumers they have built elevated rectangular steel tanks, 12 feet deep and three stories high, each holding 1,500,000 gallons. The highest tank is 230 feet and the lowest 200 feet. These elevations are sufficient to supply the ordinary buildings in the city, but the office buildings and other high structures have their own electric pumps to raise the water to tanks on the roofs.

The employees at the water-works stations work generally on the three-shift schedule. The employees at the Recoleta station number about 1,500 and at the Palermo station about 1,200. All sanitary provisions are made for them, even to the extent of providing large dining-rooms at the power-plant, and all appointments are immaculately clean.

Patrol Maintenance of Roads

Suggestions for Individual Patrolmen

A LIST of practical suggestions to patrolmen was framed last year by Frank W. Harding, Superintendent of the Ingham County Road Commission, which are worthy of reproduction at this time, in view of 1924 maintenance activities:

Don't try to float when the road is frozen.

Don't bother with snow when it is not over 3 inches deep.

Don't get too close to gravel when removing snow.

Don't let your road get rutty. Use your grader.

Don't let your culverts and ditches get clogged. Drainage is necessary.

Don't try to float with wheels of grader. Use the blade.

Don't try to cover your road in one round. It can't be done.

Don't kill the job in order to fatten your horses. They are hired to work.

Don't work unless there is something to do.

Keep weeds and brush cut from fence to fence.

Don't let the sod on the brims grow. Take it off with grader.

Don't forget you are responsible for the condition of your section.

Don't lose your tools. Remember they are charged to you. If worn out or broken, return pieces.

Don't let the other fellow keep up his section cheaper under same conditions than you.

Don't hire unless it is necessary. It adds to the cost. When the yearly report is handed to you, look it over, and if you are higher than the other fellow find the reason.

You must do your work just as well and just as cheap or the other fellow gets the business.

You are your own boss and keep your own time, and in making it out don't let your pen dictate to your conscience.

How Polluted Water May Be Made Safe

THE New York State Department of Health, through its Commissioner, Dr. Matthias Nicoll, Jr., broadcasts each week from Station WGY, Schenectady, N. Y. Radio Health Hint No. 105, which was broadcast recently, told "How Polluted Water Can Be Made Safe to Drink."

Household sewage from large communities frequently contains the germs of typhoid fever and other water-borne diseases. Water polluted by sewage is never safe to drink, unless it has been purified. Failure to-day on the part of municipal water officials to safeguard water-supplies is inexcusable. "If a community can find an adequate supply of water from an unpolluted source," said Dr. Nicoll, "it is saved the expense of purification, and at the same time there is the additional security that the purity of the water is not wholly dependent on the human factor. Unfortunately, however, this is not possible for many municipalities. The cost of obtaining such a supply may be prohibitive and as a result water is pumped from some near-by polluted lake or stream. In the long run, the former may be much cheaper, for if polluted water is used, the cost of purifying it may be large, or, if it is not purified, the cost in sickness and death—if it could be measured—may prove to be still greater.

"Probably most people judge the safety of a water by its clearness, odor, taste and color. As a matter of fact, a water can be perfectly clear and sparkling and have no odor, taste or color and still be capable of transmitting diseases, such as typhoid fever. Only a sanitarian is competent to decide what waters should or should not be used for drinking.

"Water which is polluted must be purified before it is safe to drink. The oldest and simplest method of purification is by storing it in open reservoirs for long periods of time—several weeks or months. By this method, reliance is placed upon three natural phenomena—first, sunlight, which rapidly kills disease-producing germs; second, sedimentation or settling, by which the germs are gradually carried to the bottom along with silt and other materials; third, the inability of most germs to multiply in water, those originally present dying as their food supply is used up. Some waters are so dirty that sedimentation alone will not produce a clear water or are so grossly polluted that storage in reservoirs cannot be depended upon to render the water safe. In such cases, certain chemicals are added which produce a thin jelly-like substance that gradually settles, taking with it the fine particles of dirt and germs, thus clearing the water in exactly the same way as white of egg clears coffee. This is not enough, however, to make polluted water safe to drink, and further treatment must be given it. Again, we imitate nature's method. Artesian well water is pure, because the water has percolated through many feet of soil, where changes occur which clean out all the impurities. We accomplish the same result by passing the clear water through artificial beds of sand which filter out the remaining impurities. Then the final product usually is treated with a small amount of chlorine as an additional protection so as to guard against any imperfect action of the filter or any unforeseen or unrecognized accident in the process.

"Some people are afraid of the effect of the chemicals used in water purification. Such apprehension is groundless. The chemicals that are used to cause settling go to the bottom and practically never get into the water again. The amount of chlorine added, while sufficient to kill germs, is only about one part in a million parts of water—so little that it cannot possibly harm anyone."

New York Protects Aqueduct Water with Chlorine

TO prevent the possibility of pollution of a part of the water-supply for the borough of Manhattan, New York City, the Department of Water Supply, Gas and Electricity is installing a chlorinating plant at the 135th Street gate-house.

The old Croton water-supply flows to the Central Park reservoir through two aqueducts, which meet at the 135th Street gate-house. According to a report submitted to the Board of Estimate recently an interruption in the flow of water through the aqueduct gave the Department an opportunity of making an inspection. Leakage was found in some of the joints of the aqueduct structure along Amsterdam Avenue where it is paralleled by two sewers, one of vitrified pipe and the other of brick. A number of the aqueducts are of brick and others are through solid rock. Leakage was found coming through the rock fissures. This seepage is rain flow, and tests have shown no evidence of sewage pollution. There is, however, a possibility of a break in the sewer, so that a chlorinating plant is vitally necessary.

The Cost of Adequate Street Lighting

By L. A. S. Wood

THE advantages to a city of an improved street-lighting system are thoroughly appreciated by the public, but the cost of adequate street lighting is not so well understood. This is a subject of the utmost importance to municipal officials, and a clear analysis of the whole situation is necessary before the cost of adequate street lighting can be determined.

The conditions governing the cost of adequate street lighting are the same with municipally operated street-lighting plants as with a public utility service, and, in either case, the public must ultimately pay the interest on the investment and a fair depreciation on the equipment, or the system cannot be operated satisfactorily. We cannot get "something for nothing," and if a city wishes to possess an adequate street-lighting system, it should be prepared to pay adequate rates to obtain it.

The public, unfortunately, has been to some extent misled as to the cost of street lighting, because in the early days of electricity, street-lighting rates were not always based on the actual cost of the service, but were often quoted in consideration of some concessions in connection with the granting of the franchise. Furthermore, street-lighting rates have remained practically constant for many years, and we are paying to-day little more per capita for street lighting than we paid twenty or thirty years ago. In view of the enormous increase in the costs of labor and material in recent years, this is manifestly unfair, and we are led to ask, how is the service maintained under these conditions?

Public utility companies and municipal street-lighting plants have been able to maintain street-lighting service with existing rates and appropriations, because of the developments in street-lighting units which have increased the efficiency of the units and reduced the costs of labor and maintenance. The introduction of the Mazda C lamp and the consequent reduction in trimming costs was coincident with the rapid increase in the cost of labor and material. As a result of this development, the arc lamp, which up until 1913 was the standard unit for street lighting, has in considerable measure been replaced by the Mazda C lamp, and street-lighting services were maintained without increases in the rates.

The sale of street-lighting service at existing rates is not profitable and consequently is not an attractive business for the central station. Superficial observers might conclude that a low rate for street lighting would be advantageous to a city, but unless the business is profitable, the central station not only has no incentive to improve the service, but it has no funds available for this purpose. The result of this condition is a poorly maintained street-lighting system with dirty glassware and inefficient service.

It would be logical to assume that if the investment required for adequate street lighting returned a fair interest, the public utility companies would be energetic advocates of improved street lighting, whereas, at the present time, they are in general not interested in advocating improvements requiring an invest-

A MODERN DUPLEX STREET-LIGHTING STANDARD ment which might have to be covered by an inadequate rate.

What Is an Adequate Rate for Street Lighting?

This is a difficult question to answer, because the rate will depend largely on the locality and size of the city under consideration. In general, however, an adequate rate for street lighting is a rate which will return a fair interest on the investment required for an adequate street-lighting system, and one which will provide for the efficient maintenance of the system, and a reasonable depreciation on the equipment.

Unfortunately, while provision is occasionally made for an adequate street-lighting system, municipalities often overlook the importance of establishing a rate for the service which will provide for adequate maintenance. The efficiency and appearance of a street-lighting system depreciate rapidly unless glassware is cleaned at regular intervals, and it is quite evident that unless an adequate rate sufficient to cover adequate maintenance is established, little effort will be made by the public utility company for a growth in what is an unprofitable load. To keep the street-lighting losses as low as possible, the central station with an inadequate rate for street-lighting service will be apt to neglect the equipment, which, in consequence, will fail to operate at normal efficiency.

City administrations generally keep a record of "outages" in order to collect penalties imposed under the terms of the street-lighting contract, although, with modern street-lighting equipment, such outages are comparatively few. "Semi-outages" caused by dirty glassware or blackened lamps generally pass unobserved, even though such outages are a greater factor in the efficiency and appearance of a street-lighting system than the actual outages. Central stations and municipal plants cannot be expected to take care of such conditions unless adequate rates are established.

It is generally conceded that the cost per capita for an adequate street-lighting system should not be less than $1, and yet, an investigation into this subject disclosed the fact that there were only nine states in the Union in which the per capita expenditures of municipalities for street lighting exceeded 90 cents, and only four where the expenditure was more than $1. At the time the investigation was made, it was found that the average expenditure for the whole of the United States was approximately 71 cents per capita.*

Street-lighting budgets form a small portion of total municipal expenditures; and, while there have been large increases in practically all departmental expenditures, which in some cases have nearly doubled in the past ten years, there have been only slight increases in the street-lighting budgets. An investigation of municipal finances was recently made to determine "just where the tax dollar goes," and whether a fair proportion is expended on street lighting. This disclosed the rather startling fact that while 21 cents of each dollar "goes" for protection (police, fire, etc.), only 3.4 cents "goes" for street lighting.

The cost of adequate street-lighting systems can often be reduced if the street-lighting improvement schemes are carried out under a comprehensive program coordinated with, and included in, city zoning plans. In designing ornamental street-lighting installations, the most important consideration is to obtain efficient illumination at night at low operating costs, with units which will add to the appearance of the streets by day. The original cost of a street-lighting installation is seldom greater than its cost of operation over a two-year period. Most installations last from ten to fifteen years, so it is plain that a little saved or spent on the original installation becomes an insignificant consideration when compared with the importance of wise planning from the standpoint of maintenance and operating costs.

In past years the usual practice has been to confine street-lighting improvements to limited areas. Just as city planning has in the past been almost wholly confined to scattering about the city a few beauty-spots, such as civic centers, parks and playgrounds, so has improved street lighting been scattered through the agency of localized improvements carried out as private developments, or in the form of improvement districts. Nearly always the aim has been to boom a restricted area to commercial leadership through the establishment of "White Ways." The work of so-called improvement districts may be made valuable if regulated under a general improvement plan; but without centralized leadership the result is haphazard patchwork.

The average run of street lighting throughout the United States is more or less subject to the following criticisms, which are given approximately in the order of their relative importance:

1. Inadequate illumination
2. Miscellaneous growth without a definite relationship to a comprehensive city plan
3. Inconsistent transitions and gaps in pass-

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*Report of the Lighting Sales Bureau, National Electric Light Association, 1921.

ing from one section to another
4. A lack of standardization
5. A lack of classification of streets and an absence of unity of treatment of streets of the same classification
6. Too many unsightly and disfigured streets, because of insufficient attention to architectural grace and ornamentation
7. Too much temporary construction instead of building for flexible permanence
8. Too little application of correlated effort, research and talent

A scientifically derived, comprehensive, far-sighted street-lighting program correlated with a city zoning plan is not easily worked out. It calls for specialized talent in many lines of work, and, in most cases, city officials can profit by bringing into consultation the engineers found in public utility companies, whose success depends largely upon their ability to foresee future requirements and to meet them with a minimum loss in reconstruction. This nation is becoming possessed of many vast cities and most of them—like "Topsy"—"just growed." Our large industrial establishments and other privately owned projects exemplify the economy of employing talented engineers and architects. The city is, of course, more important than any of its contributing factors; and it is unfortunate that some of our cities do not appreciate the necessity of providing sufficient appropriations for this type of personnel.

In conclusion, I have the following suggestions to offer:

1. That municipal officials seriously consider the cost of adequate street lighting, and assist in the establishment of adequate rates for adequate street lighting.
2. That municipal appropriations for street lighting be increased. It is quite evident that there is room for improvement in this direction.
3. That municipal officials energetically co-operate in the efforts which are being made to include provision for adequate street lighting with city zoning plans.

ACKNOWLEDGMENT.—From a paper read at the Atlanta convention of the American Society for Municipal Improvements.

Value of City-owned Trenching Machines

OWING to the difficulty of procuring labor for excavating trenches, and to the high prices contractors were charging for such work, the Board of Public Works of Palo Alto, Calif., purchased a No. 28-6 trench machine from the Austin Machinery Corporation, in November, 1922, according to the Fourteenth Annual Report of the Board. This machine has been used constantly on excavating sewer, water and gas trenches for the different departments, and has proved very satisfactory. The work done to July 1, 1923, was as follows:

Lineal feet sanitary sewer trench excavated	6,083
Lineal feet storm sewer trench excavated	3,145
Lineal feet water trench excavated	13,425
Lineal feet gas trench excavated	4,340
Total	26,993

Appropriated from general fund	$1,601.11
From water and sewer fund	2,806.94
	$4,408.05

This work was done for $2,228.72, not including interest and depreciation on the machine, as follows:

Labor	$1,580.10
Gasoline	200.85
Lubricants	47.30
Repairs	129.76
Supplies	270.71
	$2,228.72

Had the trenches been dug by hand at the prevailing costs, the outlay would have been $8,000; therefore the machine has saved $5,771.28, or 85 per cent of the purchase price during the eight months of operation reported.

Terre Haute's Enviable Record

DOW R. GWINN, President and Manager, The Terre Haute Water Works Company, Terre Haute, Ind., in one of his most recent letters to consumers enclosed a blue-print showing the population of Terre Haute, the number of city water consumers and the typhoid death-rate per 100,000 population from 1900 to date. The population of the city has steadily increased from about 57,000 to 67,000, and the number of city water consumers from slightly over 5,000 to a little more than 10,000, and the typhoid death-rate in the city has dropped from about 58 per 100,000 population to 3 per 100,000 in the same time. There was not one typhoid death in residences supplied with city water in the years 1922 and 1923. This is a remarkable indication of the value of laboratory control in insuring the safety of a water-supply.

In preparing for the future growth of the city, the company has recently added a 10,000,000-gallon DeLaval low-service pump, a 280- x 7-foot radial brick smoke-stack built by the Heine Chimney Co., and two 312-horse-power Stirling boilers with Green chain grate stokers, superheaters and Vulcan soot blowers. Other extensive improvements are being planned, such as two additional pumps, additional filters, a coagulating basin, and a clear water reservoir of 4,200,000 gallons capacity. Alvord, Burdick & Howson are the consulting engineers.

The motto of the Terre Haute Water Works Company is: "A water utility's value to the community may be measured by the character of the service it furnishes."

The Relation of Fire Protection Requirements to the Distribution Systems of Small Towns

By Clarence Goldsmith

Assistant Chief Engineer, The National Board of Fire Underwriters

IN the design of the pipe distribution system of water-works to supply a small town, the selection of the pipe sizes should be based upon the fire protection requirements. The rates at which water must be furnished to supply even moderately adequate fire protection far exceed those which are required for domestic consumption and the few manufacturing activities. Consideration should therefore be given to determining the probable fire demand.

Sections containing small dwellings of low heights occupying not more than one-third of the block front require two fire streams, or not less than 500 gallons per minute. It is true that a large proportion of fires occurring are extinguished by chemicals, small appliances, and perhaps a dash of water from a single hose line, but provision should be made to cope with a fire which has reached considerable magnitude by the time the fire company arrives. Where the buildings are sufficiently close to expose one another, that is, with a separation of 50 feet or less, such as occurs at and near the business center, there is a further complication, for additional streams are needed to protect the exposed building or buildings. It may therefore be assumed that two additional streams, or four in all, should be provided for even the smallest community at places where buildings are grouped.

Effective Fire Streams

For effective fire fighting, in order to prevent fire from spreading from building to building where the buildings are congested, the streams should be of sufficient size to penetrate the burning building and wet down those buildings which are exposed. This requires play-pipes having nozzles of 1⅛ to 1¼ inches in diameter and fair pressures, for a nozzle pressure of from 30 to 40 pounds is required to give an effective horizontal or vertical reach of about 60 feet. It therefore appears reasonable that towns having populations of 2,000 or less should have four or more fire streams of 250 to 300 gallons available, which makes a minimum requirement for fire protection of from 1,000 to 1,500 gallons a minute. More water is required for the protection of larger towns. This subject has been thoroughly covered by previous papers presented to the American Water Works Association.

The next step in the design of a distribution system is to provide for the concentration of the streams. The friction loss in fire hose is one of the greatest limiting features in fire-fighting, and, together with the number of streams required, determines the location and spacing of the hydrants, for unless a sufficient number of hydrants are provided, the loss in the long hose lines renders an otherwise satisfactory supply ineffective. In order that there may be no unnecessary loss between the mains and the nozzle, the hydrants should be of such size and design that the losses in them are kept at the minimum. The hydrants should have a sufficient number of outlets to permit the connecting of the required number of hose lines. With the assumption that four fire streams are the minimum number required for any group of buildings, it is evident that at least two hydrants should be available. Hose lines should not exceed 400 or 500 feet in length, which requires that the hydrants be not more than 300 or 400 feet from the building to be protected. Where direct hydrant hose streams are used, these distances should be about 100 feet less than when fire engines are available to raise the pressure. As a general proposition, there should be one hydrant at each street intersection, and intermediate hydrants should be set where the distances between street intersections exceed 350 or 400 feet.

When the quantity of water required for fire-fighting needs has been determined, a map should be prepared showing the streets and buildings, and groups of buildings to be protected should be indicated on the map. It then becomes a simple matter to place on the map the necessary hydrants to enable the number of streams required in the various parts of the town to be concentrated in a satisfactory manner. With this preliminary information available, the design of the distribution system can be approached in an intelligent manner.

Although generally in designing a distribution system for a small town it would not be economical to provide for the protection of additional values, which would probably develop in the next fifteen or twenty years, the design of a system should be made with this in view. It would not mean that the mains to be laid should be of sufficient capacity to care for these possible future demands, but the pipes now being laid should be so routed and of such capacity that while taking care of present requirements they would lend themselves to be incorporated in a system which might be required twenty years hence.

Location of Source of Supply

The location of the source of the supply has a most important bearing on the design of the distribution system, for the maximum fire demands necessarily tax any economically designed distribution system to its utmost, and, therefore, all mains laid should be located with the idea of making them available as water carriers to the points where the greatest fire demand will occur. This is usually in the center of a town, although frequently a group of manufacturing buildings or warehouses along the railroad in some other part of the town may require as much, and sometimes more, water than the mercantile center; ordinarily this center is the determining factor in settling upon the capacity required. It is desirable to have the mains serving the central section enter from at least two sides in order to utilize their greatest capacity and at the same time secure reliability in case of accident. It is therefore seen that the most ideal layout is to have a pumping-station on one side of the city and elevated storage on the other side, provided the topography is such that a sufficient elevation is available for a reservoir. Stand-pipe storage is seldom of any value in an extended fire, but such storage is often economic from the operating standpoint, as it permits the shutting down of the pumps in small plants during the night and also can furnish the fire demand for the short period required to get additional boilers, pumps, or other equipment into service in case of a large fire. It is always desirable to have the capacity of the elevated storage sufficient to equal or nearly equal the fire demand for a five-hour period.

When the location of the source of supply has been determined and it has been decided whether the fire supply could be best supplied from elevated storage, it is then necessary to determine whether dependence for fire fighting shall be placed on the pressures carried in the mains or on fire engines. Effective fire streams require that pressures be maintained at the time of fire flow at about 60 pounds at the hydrant, although, where buildings are low and scattered, this pressure may be reduced to 50 pounds. In order to maintain this pressure for direct hydrant hose streams, the amount of pressure which can be lost by friction in the distribution system is necessarily very small. Where fire engines are used, they can secure an adequate supply of water if the pressure at the hydrant is reduced to about 20 pounds, and in some cases where the mains are of ample size and low pressures are carried, due to low elevation of reservoir, pressures lower than this are capable of furnishing a satisfactory supply, but it is advisable to have 20 pounds available to overcome the friction loss in the hydrant branch, hydrant, and suction hose. In direct pumping systems it is practicable to carry fire pressure up to 100 pounds. When it has been determined what pressure is to be carried, either by the elevation of the reservoir or the elevation of the supply works, and the pressure to be carried at the pumping-station, it is an easy matter to calculate the total permissible drop in pressure in the mains, due to friction, in order to furnish either 60 pounds or 20 pounds at any point in the system.

In order that the discussion may be confined as closely as possible to distribution systems, it will be assumed that the pumping-station is located fairly close to the center of the town or that the supply main is of sufficient size to deliver ordinary consumption demands with only a few pounds drop in pressure. This is a reasonable assumption, as the fire demands far exceed the consumption demands in smaller towns.

Layout of Mains

A study of the street map should now be made in order to select the most direct routes from the supply works to the point of greatest demand, so that unnecessary friction losses will not be built up by following circuitous routes. At the same time consideration must be given to the protection of buildings between the pumping-station and the center of the town. It is advisable to select certain streets through which additional mains may be laid in the future to meet the increased demands due to growth. After locations of the through mains have been determined, the best method of connecting them and the best method of tying them together by mains of sufficient size to deliver the required capacity where it is needed should be considered. When this has been done, the next step is to provide mains to supply the other sections which it has been decided to serve. Mains extending into these sections should be looped, if possible, so that more adequate and reliable supply may be available from the hydrants than if they were supplied from dead ends, for friction losses are much less when equal quantities of water are being drawn from a looped line.

Planning for Increased Demands

In making the preliminary design it will be found advisable to provide a fairly extensive system, and if estimates show that its cost will exceed the funds available, it will be possible to eliminate the immediate installation of mains in some of the streets by rerouting some of the lines and setting a second hydrant at some street intersections. When the growth of the city requires additional protection, in certain sections, the laying of mains in the streets originally left vacant will sufficiently reinforce the distribution system to meet the increased demands. In making this study, however, decreasing the sizes of mains for economic purposes should not be considered. It will probably be found necessary to furnish domestic consumption in some of the streets not served by the large mains which are originally installed, but this can be taken care of by laying service pipes of sufficient size to the premises of the consumer. One- and two-inch pipe will generally be found adequate for this service. By adopting this method it will be unnecessary to trench entirely through each street, and thus some money can be saved. In the end this method is preferable to laying 4-inch mains, for they are not considered suitable for fire service. Friction loss in pipe of this size is 3 pounds per 100 feet for a flow of 250 gallons, and 12 pounds for 500 gallons. It is theoretically possible to use short lines of 4-inch pipe for supplying one intermediate hydrant, but the actual saving in cost in using this small-size pipe over using 6-inch pipe is not sufficient to justify its use, particularly as the capacities of modern fire engines range from 300 to 1,000 gallons per minute, and average about 700 gallons. For the same reason it is undesirable to use 4-inch pipe for hydrant branches. Excellent fire protection in smaller places can be furnished by 6-inch pipe when looped or forming part of a gridiron system; however, when dead-end lines exceed 800 feet in length, and it does not seem probable that they can be looped or connected for some time, it is economical to use 8-inch pipe.

Preparing for Possible Cut-Outs

In laying out any distribution system the idea should not be lost sight of that it may be necessary to cut out any line at some time in order to make repairs or connect into some extension. It is therefore essential in order to furnish reliable fire protection that two or more lines be laid in preference to a single line of equal carrying capacity. From pumping-stations the mains should extend along two or more different routes and ultimately meet at or near the place of greatest demand. It is often desirable to lay mains cross-connecting the principal feeders or force mains from the pumping-station in order to provide local fire protection and domestic consumption, but it should be remembered that these mains do not contribute in any appreciable degree to the carrying capacity of the distribution system to the point of maximum demand, as their function is confined to furnishing the local supply or to giving greater concentration at some intermediate point along one of the supply mains; that is, if there are two mains from the pumping-station to the mercantile district, a cross-connecting main at a half-way point will not carry any flow of water during a demand in the mercantile district, unless the size of one of the principal mains is changed at some intermediate point, in which case the cross-connecting main will come into play, and by equalizing the flow, enable more water to be delivered into the district considered.

When a system has once been installed, it is of prime importance that it be operated with all the valves open. This point is not only pertinent in a small-town system, but assumes equal, if not greater, importance in larger distribution systems. In some larger cities it has been the custom to extend large mains for considerable distances through the distribution system without making any connections, or, if they be made, operating with the valves on them closed. These mains are termed "trunk" or "express" mains, and are operated to deliver into remote areas under the impression that by this means a more satisfactory supply is assured. This is an erroneous assumption, for it is evident that if the distribution is so weak as to cause excessive losses under domestic consumption demand it will be entirely inadequate to furnish fire protection. When pressures in outlying sections are depleted to such a degree that the service is unsatisfactory, it should serve as a warning of the necessity of additional main carrying capacity, not only to deliver water into these outlying sections, but to increase the supply to the intermediate area.

In many systems it appears to have been the opinion of the engineers installing large mains leading from the pumping-station that it was unnecessary to connect all of them to the intersecting mains of the distribution system. This may be true where these supply lines extend along the same or adjacent streets, but where they follow fairly well-separated routes, it is obvious that these mains should be connected so as to feed the territory through which they pass. Frequently the argument is advanced that the cost of the specials and additional gate-valves necessary to make these connections is not warranted, and the reliability of these important lines is menaced by the large number of connections. It is not necessary to connect each intersecting main with a large main, but all lines 8 inches and larger in diameter should be connected, and those 6-inch mains which are not cross-connected within several blocks of a large main. The best and most reliable method of connecting large mains with the minor distributors is by means of a run-around connection. These connections can be made between existing pipes by the use of tapping machines.

ACKNOWLEDGMENT.—From a paper read at the Annual Convention of the American Water Works Association, May, 1924.

City Water-Works Report Surplus for the First Time

THE water-works of South Bend, Ind., in its annual report for 1923, states that the utility showed a surplus for the first time in its history. This is due solely to two causes: an extraordinary season in which frequent rains eliminated the normal maximum demand that should be anticipated; and the connection in the past two years of such a great number of new consumers that under normal conditions it would have been physically impossible to render satisfactory service to any one, and any service at all to a large number.

This last condition is being corrected by the building of a new station in the southwest part of the city adjacent to the New York Central Railroad, to be known as the Oliver Park Station. This station was designed entirely in the office of the utility, and the plans as prepared were approved by Burns & McDonnell, engineers, of Kansas City, Mo.

The supply consists of a well-water supply of approximately 12,000,000 gallons daily from twenty-four 12-inch wells, averaging about 140 feet deep. These wells are to be pumped by siphon action through a suction well 18 feet in diameter and 48 feet deep.

The station equipment is to consist of two cross-compound crank and fly-wheel Corliss pumping engines of the opposed type, having a capacity of 5,000,000 gallons daily each. Steam for operating the engines will be generated by a battery of two water-tube boilers normally rated at 150 horsepower each and operating at a pressure of 175 pounds per square inch with an added superheat of 75 degrees Fahrenheit. The equipment will be housed in a fire-proof building of brick and concrete with cut stone trim.

A complete coal- and ash-handling system is being installed to reduce the operating labor to a minimum; delivery of the coal will be over the private switch to the station, where the cars will be dumped and the coal handled mechanically to the storage hopper, from which it will be fed by gravity to the weigh-larry in the boiler room.

Variations in Daily Consumption Throughout the Year

THE following table shows the daily per capita consumption of water in the cities and towns in the Metropolitan Water District of Boston for the year 1923, as registered by the various master meters between the Metropolitan supply and the various cities and towns. Practically all the communities, with the exception of Boston, Chelsea, Revere and Somerville, are residential communities. It is interesting to note the tremendous apparent increase in per capita consumption in Nahant, extending from May to October. This is undoubtedly caused by the large number of visitors to the community during the summer, as it is a seashore resort.

City or Town	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Arlington	53	55	53	50	56	74	64	63	70	63	51	50	58
Belmont	56	58	60	63	66	85	77	72	82	70	57	55	66
Boston	120	124	117	110	111	112	108	110	113	112	109	110	113
Chelsea	83	90	85	79	76	79	80	79	77	78	75	75	80
Everett	99	107	98	95	94	106	101	101	102	100	96	100	100
Lexington	52	58	57	59	68	91	74	72	75	64	54	48	64
Malden	57	58	57	55	53	56	55	55	58	54	50	48	55
Medford	54	57	56	58	66	61	60	59	58	56	53	52	58
Melrose	60	61	61	59	63	74	72	69	70	71	70	67	66
Milton	44	46	44	41	42	47	38	38	45	44	41	40	41
Nahant	62	63	87	92	130	229	219	202	171	105	97	69	127
Quincy	80	77	77	77	79	86	85	86	83	79	78	77	80
Revere	69	74	70	68	72	83	83	84	77	71	65	64	75
Somerville	85	88	84	81	78	82	80	80	80	80	78	77	81
Stoneham	72	78	77	75	78	81	79	79	79	70	72	67	75
Swampscott	53	57	56	58	69	106	122	104	101	81	68	63	79
Watertown	86	86	77	76	74	83	77	71	75	68	63	60	75
Winthrop	51	53	51	52	54	66	68	66	57	51	48	47	55
Met, Dist.	103	105	99	95	95	99	95	96	97	96	92	92	97

Making an Anniversary Celebration a Real Community Affair

By W. C. Batchelor

Superintendent, Public Recreation Board, Fort Worth, Texas

THE celebration of an anniversary of the founding of a city with the avowed purpose of drawing attention to the commercial prominence of the municipality concerned is by no means a new idea. But the recent commemoration of such an event in Fort Worth, a city of 156,000, was marked by several unique features.

In the first place, the entire celebration was planned and carried out by a citizens' committee and was financed entirely by the people at large. The $31,000 raised to meet the expense of the event was given by more than 13,000 contributors.

In the second place, the entire four-day celebration was kept absolutely free from any money-making scheme whatsoever. Every event was free, no carnival shows or street vendors were allowed in town, and even the sale of toy balloons, confetti, food, soft drinks and the like was confined to The American Legion, the Veterans' Flying Corps, and philanthropic organizations. The typical games of chance were conspicuous by their absolute absence.

In the third place, it was a celebration of the people, by the people, and for the people. A working organization of 34 committees planned and carried out the divers activities. No less than 3,000 men and women held active membership in these committees, while those actually participating in the parades, pageants, entertainments and demonstrations numbered ten times that many.

In the fourth place, when the celebration was over, with all bills paid, an unencumbered balance of $3,500 remained in the Jubilee treasury.

A rare coincidence of dates made possible the observance of three distinct anniversaries simultaneously. The year 1923 marked the seventy-fifth anniversary of the designation of Fort Worth as a frontier outpost, the fiftieth anniversary of its incorporation as a city, and the fifth anniversary of the signing of the Armistice, the latter event assuming particular prominence in view of the location of Camp Bowie and three flying fields in Fort Worth during the World War.

Cooperating Organizations

The American Legion as a body took responsibility for all military observances, inviting and entertaining representatives of the War Department and all branches of the service, arranging memorial services, an Armistice Day parade, a military banquet, three simultaneous military balls, etc. The Veterans' Flying Corps, with an equally large subcommittee organization, planned and directed an aviation circus, enlisting the participation of 23 army planes and a dirigible and 31 commercial planes in addition, and awarding $1,700 in prizes for stunt flying in an all-day program.

The Lions Club, placing its entire membership on active committees, accepted as its "stunt" the street carnival, for which the entire heart of the business district (exclusive of fire-lanes) was closed to traffic and flooded with light. Twenty simultaneous, continuous vaudeville shows, staged on as many platforms built in the streets, played before the greatest mass of humanity ever congregated in one place in the city—this in spite of the fact that the second performance of the Historic Pageant with a caste of 1,200 people was presented before an audience of more than 5,000 on the same evening. Those participating in the pageant were drawn from a dozen or more fraternal orders and other organizations, practically all furnishing their own costumes.

The Kiwanis Club invited and entertained 66 mayors from surrounding towns as its particular contribution to the celebration. The local advertising club was designated as the publicity committee. More than 250,000 pieces of printed matter were circulated throughout the state of Texas in particular and the United States in general. Every known means of advertising was used, from bill-boards to aeroplanes.

To show proper hospitality to the thousands of visitors, a "Greeters Committee" was organized, comprising the entire memberships of five business clubs—the Civitan Club, the Business and Professional Women's Club, the Worthian Club, the Optimists' Club, and the

Salesmanship Club. This committee, 200 strong, arranged to meet all incoming trains on the 18 lines entering Fort Worth; all interurban cars and all automobiles during the period of the celebration being armed with the official word of greeting, "Howdy, Friend!" A special committee entertained Governor Neff, Arthur Brisbane, General Hinds, and other distinguished guests.

A music committee offered $1,600 in prizes for band contests and was able to enlist the cooperation of 23 bands during the Jubilee. This committee furnished vocal and instrumental music for sacred concerts, parades, pageant, carnival, mass meetings, etc., throughout the celebration. The Mothers' Council, comprising the Parent-Teacher Associations of the 45 schools of the city, arranged simultaneous neighborhood reunions at the school buildings following an exhibit and demonstration of school work.

A tribe of Comanche Indians was imported from the reservation in Oklahoma to lend an atmosphere of the old pioneer days, and thousands of men again donned the four-gallon hat, and women dressed in poke bonnets and calico. The local Boy Scout Council built a reproduction of the original fort erected 75 years ago as a frontier outpost. The seven buildings were afterward moved in sections to the Scout Camp and are now equipped to house 64 boys.

Decorations and Programs

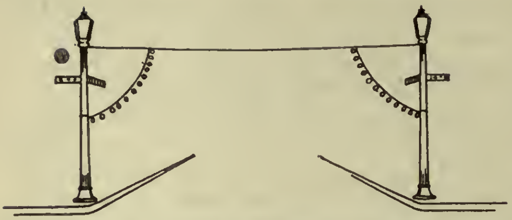
Imitation bronze tablets were erected to mark thirty historic spots, the first "variety store," the first school, the first bank, etc., and the old cattle trail, the route by which the Texas Longhorns went to the Kansas market on the hoof before the days of the railroad. Thirty-two blocks in the commercial district were equipped with decorative lighting, and sixty blocks were decorated with bunting, among which appeared prominently Old Glory, the Legion Emblem and the old flag of the Lone Star State.

A city-wide athletic program included, during the four days, fourteen football games and three polo games. The four golf clubs held tournaments, and five additional sports were included. Manufacturers and merchants held open house with displays, exhibits and an industrial parade, and the Trades Assembly held a big labor parade and mass meeting.

An Agricultural Institute fostered by the Chamber of Commerce drew large numbers; more than 1,000 attended an "Old Settlers' Ball," and 380 pioneers were banqueted. A committee of colored people worked in cooperation with the central organization, pro-

SCENES IN THE FORT WORTH CELEBRATION

Upper, left.—Reproduction of the original fort, by Boy Scouts. Upper, right.—Crowds that blocked traffic during an exhibition of the roping of "mavericks." Lower, left.—Rapid transit before the railroad. Lower, right.—Jubilee belles



FESTOONS OF COLORED ELECTRIC LIGHTS, HUNG FROM CROSS-WIRES TO THE TROLLEY-POLES ON BOTH SIDES OF THE STREET, HELPED TO BEAUTIFY FORT WORTH FOR THE CELEBRATION

moting these various activities among the colored population.

The celebration was even carried to New York City, where the Texas Club of New York and other Texas organizations in the metropolis secured Acting Mayor Murray Hulbert to decorate the statue of General Worth in Madison Square, for whom Fort Worth is named.

The decorative lighting equipment purchased from the surplus funds of the Jubilee consisted of a series of festoons of lights hung from the overhead cross-wires to the trolley-poles on both sides of the street, as illustrated in the accompanying sketch. The festoons were each made up of twelve 50-watt lamps with alternating amber, blue and clear bulbs. Every trolley pole along thirty-two blocks was decorated in this way. This temporary lighting equipment was taken down at the close of the anniversary celebration and has been stored in such form that it may easily be installed for use on any future occasion.

Officers, Executive and Finance Committees

An official of one of the railroads was appointed General Chairman, the Mayor was Honorary Chairman, a retail shoe merchant was Vice-Chairman, and the manager of the Clearing-House Association was made Treasurer. In addition to these men, the executive committee included representatives of the three local papers, the secretary of the West Texas Chamber of Commerce, an automobile dealer, president of the Ad Men's Club, and the local commander of the American Legion. These ten men also represented practically every business and commercial club in town.

The Superintendent of the Department of Recreation of the city was made Director General, and was given responsibility for the carrying out of the program. Requisitions for all expenditures were issued by him and all bills were approved by the General Chairman as well.

The Finance Committee, headed by local experts giving their time gratuitously, was divided into about 40 subcommittees, with a small group responsible for each business or professional division, from barbers to manufacturers. Supplementing their efforts, an order, springing up spontaneously, calling itself the "Sons and Daughters of Saxet" (the word Texas reversed), sold 11,000 memberships at a dollar each to swell the fund.

Value to the Municipality

The value of a celebration of this kind to a municipality is evident. Aside from being a fitting celebration of the anniversaries of the founding of the settlement, its incorporation as a city and the World War victory, it served to bring to the attention of the whole country the position which Fort Worth has come to occupy in the commercial world, particularly in the cattle, oil, grain, cotton and railroad industries.

Further than this, and by far the most vital factor in the city's progress, it united a larger number of the population than had ever before been actively engaged in a civic enterprise, and served to bring home to the rank and file the city's possibilities. The Fort Worth Diamond Jubilee "sold" Fort Worth to its population.

STATEMENT OF EXPENDITURES FROM JUBILEE FUND, FORT WORTH, TEXAS

Gross Expenditures for Jubilee

Committee	Total
Pageant	$3,467.08
Publicity	4,314.91
Music	3,480.50
Aviation	3,234.35
Decoration and illumination	4,735.31
Saxet	4,000.00
Carnival	1,198.34
Athletics	628.15
Distinguished guests	262 76
Scout activities	282.43
Jubilee Dinner	367.50
Executive	145.60
Military observance	416.30
Finances	14.95
Greeters	32.95
Indians	589.03
Marking historic spots	151.50
Public meetings	5.00
Pioneers	12.00
General Worth Memorial	85 00
Total	$27,423.66

Disposition of Balance

Purchase of decorative lighting equipment for 32 city blocks	$850.00
Donation to Southwestern Exposition and Fat Stock Show	850.00
Donation to Police Band	300.00
Donation to High School Cadet Band	300 00
Reimbursement to aviators for damage to planes	50.00
Balance in Saxet treasury for future celebrations	1,300.00
Total	$3,650.00
Grand total	$31,073.66

An Emergency Pumping Unit for a Small Water-works

By E. S. Tyner

Water Superintendent, Plant City, Fla.

PLANT CITY, Florida, is the greatest inland shipping point in the state, sending out over one million dollars' worth of strawberries each winter. Like many other cities in Florida, it is growing very rapidly, and it has practically doubled its population in the past ten years. There is nothing more indicative of a progressive town than a substantial water-works—one that can keep pace with the rapid developments and when necessary make improvements which will really benefit the community.

The first water-supply of Plant City was secured from an 8-inch well, 360 feet deep. The water was pumped from the well into a surface reservoir with a steam-driven air compressor, and from the reservoir to the mains and an elevated tank by a steam booster pump. This plant was expensive to operate and was abandoned in 1916 and the buildings and equipment salvaged.

The second well was 12 inches in diameter and drilled 630 feet deep. The water stood approximately 35 feet below the surface, and in order to maintain suction on the pumps a large pit 35 feet deep was constructed and the pumps set at the bottom. Two 50-horsepower oil engines were each geared to the crank-shaft of a 500-gallon-per-minute triplex pump, so that when both engines were running, 1,000 gallons per minute could be secured from the well. Although this proved satisfactory from a quantity standpoint, it meant that the town was depending on the two oil units for its entire supply. A shutdown in both units at the same time would have been very disastrous. Several times one unit had been down for repairs; and if the other had stopped at that time, the entire water-supply would have been cut off. This matter was fully realized by the Water Superintendent, who had suggested to the Council that a pump be installed in the old steam plant well as an emergency unit. The water in the first well was of excellent quality, but it had never been used since the abandonment of the old steam plant. Even before action could be taken, a break occurred in the main line from the well to the pumps; the plant was shut down and the well water-supply cut off. The only water available was obtained from a mill a short distance away; this water proved to be contaminated, and if the break had not been quickly repaired the water situation would have become very serious.

PUMP-HOUSE AND STAND-PIPE OF THE PLANT CITY, PA., WATER-WORKS

This incident brought the Council face to face with the real facts and the absolute necessity for an emergency unit—one that could be depended upon to take the place of the regular equipment for days or months, if necessary.

After an investigation and study of the various types of pumping equipment, a vertical turbine pump was purchased. As the new pump was 10 inches outside diameter, the old 8-inch well had to be enlarged. A 10-inch pipe was cased over the 8-inch pipe to a depth of 60 feet; the inside pipe was then cut off and pulled out, leaving ample room for the installation of the pump bowls and discharge column.

The new pump is of the centrifugal design with the pump bowls or stages set 50 feet below the ground. The high-speed centrifugal impellers which revolve in the stages force the water upward through the discharge column and out to the mains. The impellers are keyed to a steel shaft which extends upward through an inclosed oil tubing. At the surface and resting on a concrete foundation is the pump head, which contains the thrust bearing and supports the vertical slip-ring motor. A slip-ring motor is used to limit the high starting current so objectionable in the squirrel-cage motor. The shaft of the 50-horse-power motor is connected to the pump-shaft by a flexible coupling, and the pump and motor revolve as one unit.

The water is pumped direct from the wells into the mains under a 50-pound pressure, no auxiliary or booster pumps being necessary. The vertical pump produces 650 gallons per minute, or 39,000 gallons per hour, and uses in this time 40 kw. hrs.—a power consumption of 1.02 kw. hrs. per 1,000 gallons. If the electrical power cost less than 5 cents per kw. hr., we should probably install a duplicate unit, so that the complete water-supply would be furnished by deep-well vertical pumps. With electricity so high and crude oil so cheap, it is not feasible to change at this time.

The vertical unit has now been installed for over two years and has proved very valuable on several occasions. At one time when the elevated tank had to be cleaned and painted, the valve between the mains and the tank was closed. The piston triplex pumps could not be run into the mains without the overflow tank in use, and so the emergency unit was started and run for three days without a stop; a pressure of 60 pounds was maintained throughout the run. The emergency unit is exceptionally simple to start, as it is only necessary to throw an electrical switch and the pump is working at full capacity in about 30 seconds.

Because of the excellent service which the water department has rendered, the number of customers has increased to 650, and every one is metered. In addition, water is supplied to the Seaboard Air Line engines and to industrial plants. For fire service, 68 hydrants are distributed at various points in the city.

With this additional vertical turbine unit, we feel that we are prepared to meet any emergency demand that may be made on our water-works, and not only are we in an excellent position to serve our present customers, but we are prepared to care for new ones. The vertical turbine pump was furnished and installed by the Layne & Bowler Company, of Memphis, Tenn., contractors for water-supply.

Another Successful Municipal Paving Plant

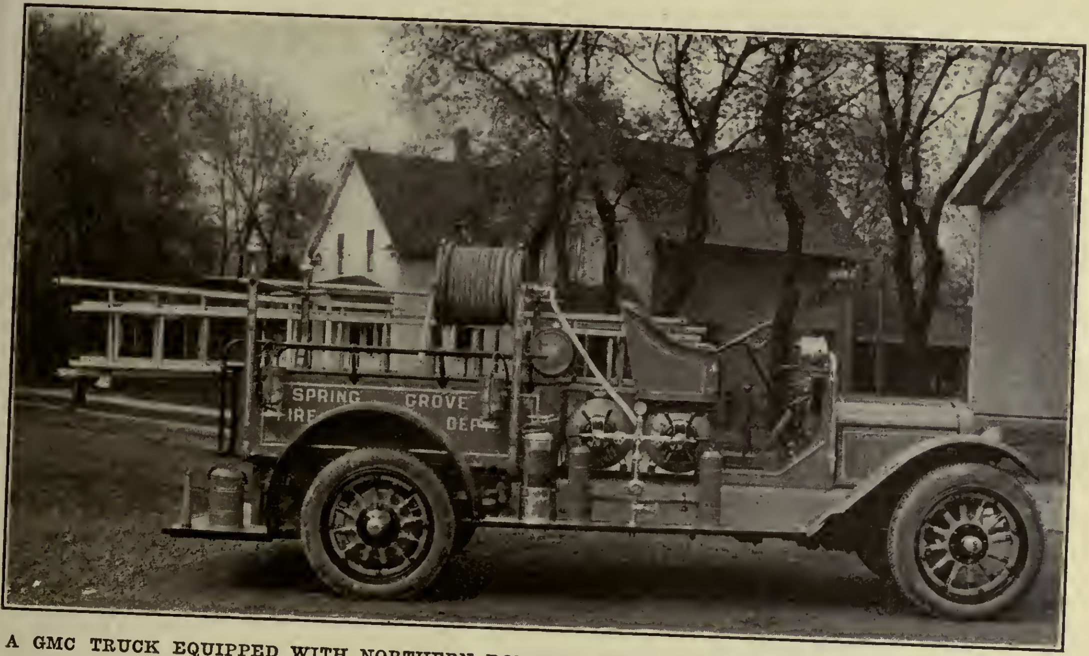
SINCE the paving plant of the city of Palo Alto, Calif., was started, in July, 1921, 1,141,454 square feet of concrete pavement varying from 4½ to 5 inches in thickness has been laid and 13,803 lineal feet of concrete curbing completed. This work completes the paving on 6.2 miles of streets, or about 73.25 blocks. The paving has progressed practically without interruption except for about 4½ months of each winter when the work was necessarily suspended because of rain.

The original specifications called for a pavement 4 inches thick with a carpet coat of road oil and screenings. This was later changed to a plain unsurfaced concrete pavement 4½ inches thick, and the present specifications are for a 5-inch pavement tapering to 7 inches in the center of the roadway, and with the curbing molded integral with the pavement. This latter specification will probably remain the standard for residential streets. Pavements built to this cross-section are showing excellent results and it is believed they will give long life with a minimum of maintenance expense and will remain smooth and non-slippery.

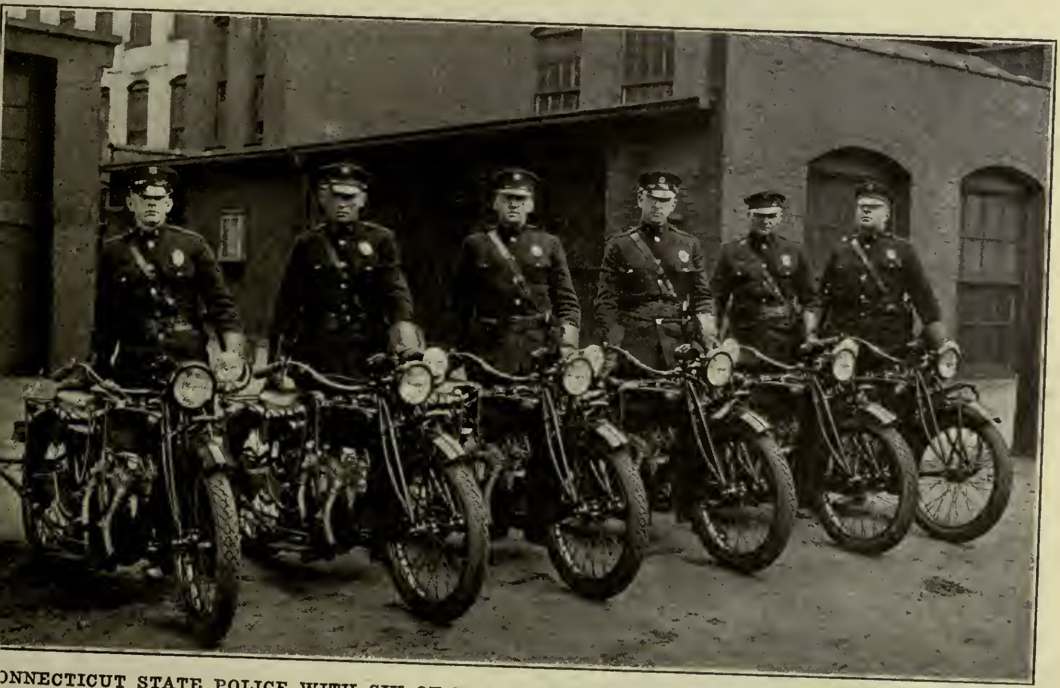
The profit and loss account of the plant for the two years that it has been operating showed a surplus of $2,563.57, which was not sufficient to meet reasonable depreciation charges, and so an increase of 4 per cent in the rates was made. The following unit costs for various types of work in Palo Alto are of interest:

Grading per cubic yard (estimate based on 12,300 cubic yards)	$1.208
Grading per square foot (based on 541,618 square feet)	0.027
(Includes removal of earth and trimming and rolling subgrade, also setting manholes and other street structures to grade.)	
Concrete mixture (based on 8,487 cubic yards placed):	
Sand and gravel per cubic yard of concrete	2.827
Cement per cubic yard of concrete	4.742
Supplies, repairs and expense (paving plant and trucks) per cubic yard of concrete	0.559
Labor, unloading materials, operating and hauling to job per cubic yard of concrete	0.843
Total cost per cubic yard of concrete delivered at job	8,970
Placing and finishing concrete:	
(Includes form setting, placing and tamping, finishing and curing concrete.)	
Labor per cubic yard of concrete	1.160
Supplies, repairs, expense	0.184
Total for spreading and finishing per cubic yard	1.343
Total cost per cubic yard of concrete in place	10.313
Concrete pavement laid per square foot	0.161
Office and accounting expense:	
(Includes engineering and assessment work, collection, etc.)	
Cost per square foot	0.013
Total cost per square foot (not including interest and depreciation)	0.201

Motor Equipment for the Fire and Police Departments



A GMC TRUCK EQUIPPED WITH NORTHERN DOUBLE-TANK CHEMICAL AND HOSE EQUIPMENT IN USE BY THE VILLAGE OF SPRING GROVE, MINN.



ONNECTICUT STATE POLICE WITH SIX OF THE 15 INDIAN SCOUT MOTOR-CYCLES RECENTLY PURCHASED FOR THAT ORGANIZATION

Psychological Tests to Prevent Motor Vehicle Accidents

By T. D. Pratt

General Manager, Motor Truck Association of America, Inc.

THE way to eliminate preventable accidents is to remove from the road the driver who has to stop to think what to do in an emergency, as well as the careless, the callous, and the selfish road-hog. This can be done almost to perfection, when measured by human standards, within a few years, provided unified effort can be brought to bear on the subject. Like all epochal changes it is simplicity itself.

The method to be used is the examining of all drivers of motor vehicles who are concerned in a motor vehicle accident with a proper psychological and practical driving test, which will ascertain their fitness to drive. Prohibit them from driving after such accident, until they have passed this test and thereby proved to the properly constituted authorities that they are, first, mentally and physically fit to be allowed the privilege of driving a motor vehicle on the highway, and, secondly, that they were blameless in the accident which preceded the examination.

By this procedure, sooner or later all who cause accidents will be brought under stricter control, those who were at fault will be eliminated, and even those who cause a series of minor accidents will be located, and thus the driver who is mentally or physically incompetent will have his license taken away and be forced from the highways. Those who are competent and careful and do not cause accidents will not be disturbed.

This utopian condition cannot be brought about immediately, for the first step of the program is education, and the education must be threefold: first, the education of the public officials who have to do with the licensing of motor vehicle operators, so that they will understand how to reduce accidents blamable on the motor vehicle driver; second, the education of the law-making bodies, so that laws empowering and compelling these officials to take the necessary and proper steps to obtain this end can be passed; third, the education of the motor vehicle operator himself, so that he will recognize the justice of this program and support it with all his heart and soul, through his organization as well as personally, until the desired result is brought about.

One has to dig deep into the fundamental causes of accidents before the real primal reason is found. The chief reason underlies the various apparent causes of most accidents for which the motor vehicle operator can be held responsible. This fundamental cause is psychological. It is the absence of alertness. It is the failure of mind and muscle to properly coordinate. It is the failure of the subconscious mind to do automatically all the things which will make for safety, so that the driver of a car will rise to the emergency and prevent an accident without stopping to think about it. It would be like the reaction of the eyelids to an impending blow. In cases of an emergency where fractions of a second count, the driver who yields to panic or who has to stop to think is lost, and an accident—frequently a fatal one—is the result.

It has been estimated by various authorities, that from three to five per cent of the drivers of motor vehicles cause all the accidents. There is a method of examining this percentage and weeding out the unfit, available to all who wish to use it, which has proved remarkably efficient.

During the war the Army established certain testing grounds on which were tested all applicants who wished to drive army cars and trucks. In a record comprising nearly 100,000 cases it was shown that a large percentage of the applicants, from one-quarter to one-third, failed to pass the test which was given them, the first time they tried it. It was also found—and this is the crux of the whole problem—that less than five per cent of those who failed on the first examination were ever able to pass it thereafter, regardless of the number of attempts they made on reexamination.

This examination seems to have combined to a very high degree the two requisites which any proper examination must have. It first showed the applicant's knowledge of his vehicle and his ability to operate it mechanically, and, second and far more important, it showed whether his mind and muscles coordinated in such fashion that he could be relied upon to do the right thing at the right time in an emergency and thus prevent an accident.

It can readily be understood from this that if those of the fifteen to twenty million drivers in this country who are concerned in accidents on the highways were forced to take such an examination as is herein urged, in a very short space of time the careless, the indifferent, the temperamentally unfit, would be weeded out; and if the same methods were applied in the future at the original examination for a driver's license, very few who were unfit to drive would ever get the privilege to do so.

This method of solving one of the worst problems in the country is offered, with all earnestness, for the consideration of public officials and also of the motoring public in general.

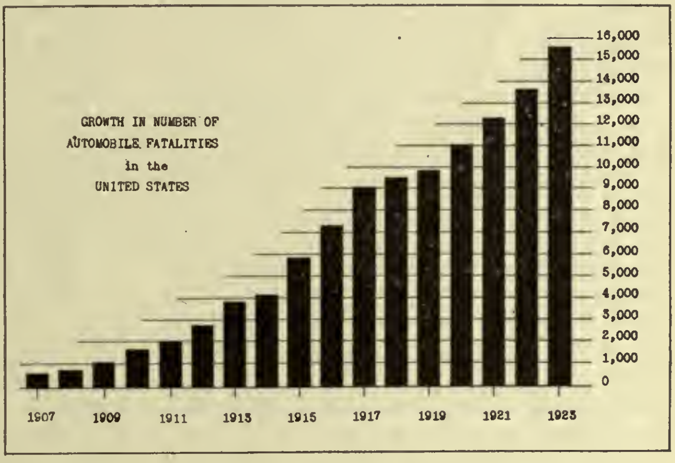
Automobile Fatalities in the United States During 1923

APPROXIMATELY 15,700 lives—an average of 43 each day—were lost in motor vehicle accidents (exclusive of grade-crossing collisions between motor vehicles and trains) in the United States during 1923, an increase of nearly 2,000 over the record of 1922. If the grade-crossing fatalities are taken into account, the total of motor-vehicle deaths for 1923 exceeds 17,000.

This estimate has been made for the National Safety Council by the Automobile Department of the National Bureau of Casualty and Surety Underwriters on the basis of statistics supplied by the health officers of 135 American cities with an aggregate population as of July, 1923, of 30,128,555. The cities included in the study range in size from 25,000 population upward and are scattered over the entire country.

The 1923 automobile death-rate for the 135 cities studied was 13.4 per cent higher than the 1922 death-rate for the same cities. Application of this factor of increase to the 1922 country-wide death-rate of 12.5 per 100,000 population produces a 1923 country-wide death-rate of 14.2. This death-rate multiplied into the population of the United States as of July 1, 1923—estimated at 110,663,502 by the Bureau of the Census—produces a total of 15,700 deaths. This assumes that the rate of increase in motor vehicle accidents was no greater in rural districts than in cities, which is doubtful, because while many cities have, through successful safety campaigns, been able to cut down the number of their automobile accidents, no such campaigns have thus far been conducted by rural communities.

The 1923 accident reports submitted by the health officers of the 135 cities showed that 32 per cent of the total fatalities were children under fifteen years of age. This percentage applied to the country-wide estimate indicates that 5,000 children were killed last year in automobile accidents over the country.



Sunken Road to Replace Canal; Motor Trucks to Replace Mules

A BILL before the British Parliament presents a novel idea in transportation, says Hugh D. Butler, acting commercial attaché, London, in a report to the U. S. Department of Commerce. It purposes the draining of Regent's Canal and its conversion into a sunken road for motor freight traffic. The canal, completed in 1820, extends from the Thames at Limehouse Basin to the Grand Junction Canal at Paddington, and before the advent of railways carried an enormous tonnage. It is 8½ miles long, 60 feet wide, and 12 feet deep.

The plan is to revet the sides, pave the bottom, and have two 20-foot roadways through the center for through traffic, and a 10-foot space on each side for loading and discharging vehicles. Water, electricity, and sewage would be carried below the roadway. The Thames end is in the center of the dock system on the north side of the river, and is within 500 yards of the Rotherhithe Vehicular Tunnel, which crosses under the river to the great Surrey Commercial Docks on the south side. The canal passes near all the great railway freight terminals north of the Thames, except the Liverpool Street Station of the present London and Northeastern Railway.

Uses of Single-Track Concrete Roads

By Allan M. Jackson

Engineer of Brant County, Ontario, Canada

A SINGLE-TRACK road will go about twice the distance a double-track road will go for the same money; so that the question resolves itself into the choice of twice the length and half the width or twice the width and half the length. Single-track roads are a financial expedient, in the writer's opinion. Nobody would build a hard-surfaced road wide enough for one vehicle at a time if he could afford to build it wide enough for two. I have found that a 9-foot concrete slab laid on one side of the center line of a road with a 9-foot gravel track on the other side of the center line costs from 57 to 60 per cent of the price of an 18-foot slab. This comparison is made on the basis of the turnpike required by the Ontario Department of Highways for a provincial county road 28 feet from shoulder to shoulder. It will readily be seen that the actual grading and ditching for both types would be the same, that the water-supply for mixing and curing the concrete would be the same for both types, that the cost of actual curing would be slightly greater in the case of the narrow type on account of the increased amount of moving of the plant and forms, and, finally, that the principal reason why the one type cost more than one-half the cost of the other is the addition of a gravel track beside the concrete.

The Brantford Suburban Area Commission was operating on the pay-as-you-go plan in 1920 and was in the position of having just sufficient money to maintain its roads and to build one mile of 18-foot concrete road each year. The two heaviest-traveled roads were the two main market roads, with a suburban area of 4 miles each. Eight miles of full-width concrete road would mean that it would be eight years before the last taxpayers were served. The Commission decided to build half-width concrete and to place the slab on one side of the center line. Two miles were built in 1921 and two miles in 1922 and the other half of the roadway constructed of crushed pit-rock gravel. The experiment appears to have justified itself, and at the end of four years instead of eight, the taxpayers of both these roads will have an every-day-in-the-year road to their market town.

The Concrete Road

The concrete roadway is 7 inches thick throughout and tilted 2 inches. One edge was laid on the center line of the turnpike and 9 feet of pit-rock crushed gravel was laid outside in two layers and consolidated by traffic. The concrete was 1:1½:3⅓, using 2-inch to ⅜-inch crushed stone and a grade of crushed sand which proved satisfactory under the standard tests. All curves were banked, but in the first season's work where the slab was on the outer side of the curve, no widening was used, because it was figured that the widening would be made on the inner side of the second slab when the road was double-tracked. This was a mistake which had to be remedied the second season. Widening of curves on a single-track road is more necessary than on a double-track road.

The Gravel Road

The gravel part of the surface has been kept dragged smooth and well up to the surface of the concrete, our endeavor being to keep the gravel slightly overlapping the edge of the slab. Extra material has been added to the gravel when it has been consolidated below the slab, and the ready adherence of new material in very thin layers to the existing gravel road is one point which makes this type of construction more suitable in gravel counties than in those where only macadam is used.

The cost of maintenance on this road has been definitely determined to be one-fifth of that on adjacent stretches where the whole surface is gravel, and it is estimated that with a vehicular traffic of something over 500 vehicles per day during the summer, 90 per cent of the travel is on the slab.

Some Road Signs Suggested by "Bugs" Baer

Don't run up your mileage with skids.

There are three grades of eggs, but only one grade of crossing, and that's dangerous.

Don't do your thinking with your brakes.

You wouldn't travel on a freight train, so don't try to travel under one.

The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

The City as a Dealer in Commodities

THE trend of the latest decisions of courts of last resort on the subject is to sustain the right of cities to engage in the sale of fuel and other necessities of life, where there is charter authority to that end and emergencies reasonably justify the municipality in engaging in the business.

In one of these cases (Consumers' Coal Co. vs. City of Lincoln, 189 Northwestern Reporter, 643), the Nebraska Supreme Court held that the home-rule charter of the defendant city was too narrow to empower the city to operate a retail fuel business, in the absence of an emergency, which was not shown to exist.

The gist of the opinion of the Court is that charter power to acquire and operate gas and electric plants for the manufacture and distribution of heat, etc., does not impliedly authorize the establishment of a fuel yard. But the Court adds:

> "We do not understand it to be claimed that the ordinance in question is referable to the general welfare section of the charter. To bring it within the police power to which this section refers, some public emergency would have to be shown, such as a coal famine, or monopoly, whereby the 'government might be able to obtain fuel, when citizens generally could not. Under such circumstances we are of the opinion that the government might constitute itself an agent for the relief of the community, and that money expended for the purpose would be expended for a public use.' Opinion of the Justices, 182 Mass. 605, 66 N. E. 25, 60 L. R. A. 592. No such emergency is suggested."

About the same time, the Minnesota Supreme Court ruled that the establishment of a municipal fuel yard was a public purpose (Central Lumber Co. vs. City of Waseca, 188 Northwestern Reporter, 275), and that a clause in defendant's home-rule charter expressly authorizing the activity was not violative of the state constitutional prohibition against levying taxes for private purposes. The Court observes:

> "The question is whether the establishment of a municipal coal and wood yard is a public purpose. It is to be assumed that in framing their charter the people were informed of conditions, such as the sources of supply, the ability and disposition of dealers to care for local demands, and other relevant factors affecting the situation, and found that public necessities and conveniences were such that the establishment of a municipal fuel yard was a public purpose. They have the responsibility of their finding and the wisdom or folly of the policy which they authorize. Their determination of public purpose is not final. It is accorded weight; but finally the Court must determine as a judicial question whether the purpose for which taxes are exacted is public.
>
> "Economic and industrial conditions are not stable. Times change. Many municipal activities, the propriety of which is not now questioned, were at one time thought, and rightly enough so, of a private character. The constitutional provision that taxes can be levied only for public purposes remains; but conditions which go to make a purpose public change.
>
> "In our judgment the establishment of a municipal fuel yard is a public purpose."

The opinion then cites two decisions of the Maine Supreme Judicial Court and a decision of the United States Supreme Court affirming one of them (38 Supreme Court Reporter, 112). In the last cited case, the highest court of the land said:

> "We see no reason why the state may not, if it sees fit to do so, authorize a municipality to furnish heat by such means as are necessary and such systems as are proper for its distribution. Heat is as indispensable to the health and comfort of the people as is light or water. In any event, we are not prepared to say that when a state authorizes a municipality to tax with a view to providing heat at cost to the inhabitants of the city, and that purpose is declared by the highest court of the state to be a public one, the property of a citizen who is taxed to effect such purpose is taken in violation of rights secured by the Constitution of the United States."

The Minnesota Court cites decisions in which a contrary conclusion was reached, but announces its preference to follow the line of cases upholding the right to operate municipal fuel yards.

Perhaps the leading decision leaning against the right of a city to engage in the business of dealing in commodities is that handed down by the Missouri Supreme Court in the case of State ex rel. Kansas City vs. Orear, 210 Southwestern Reporter, 392. Holding that Kansas City was not empowered to establish a municipal ice plant, without modification of its charter and the Missouri constitution, the Court said, in part:

"Ice has but recently been elevated—granting for argument's sake the promotion—to a place among the necessities of life. . . . But be this as it may, it is yet certainly no greater a necessity to the human race than are food and clothing. If a city should undertake, absent compelling necessity at least, to establish and operate grocery stores and clothing 'emporiums,' no one would hesitate to say that no power exists in the municipality to use public money, or the proceeds of public taxation, for such purposes. Such things may be given away by the city to paupers and to the temporarily unfortunate, but the city cannot enter into the business of selling such articles to all inhabitants of such city who may desire to buy. If the cities, towns and villages of the state deem that their entry into private business in competition with individuals now engaged in such business is a matter of public expediency, then the initial effort to this end must be an amendment to the constitution; and following such an amendment, the passage of an act changing the common law, which, even without the aid of the constitutional inhibition, forbids the levying and collecting of taxes for any private purpose or business. . . . If the situation were one of continuing or perennial necessity, a city might well have the power under the general welfare clause of its charter to take such steps as would be requisite to supply the compelling need for any such necessity of life so long as such condition existed."

The Georgia Supreme Court has sustained the right of a municipality to establish an ice plant on the broad authority of the general welfare clause of its charter (94 Southeastern Reporter, 1022). But, in an earlier case, the same court denied the right of the city of Waycross to engage in the plumbing business, as an incident to operating a water-works system.

Other decisions will be found cited in the opinions to which reference has been made above.

Sundry Items of Municipal Law

Power of City to License Structures in Streets

A city is powerless, except as expressly authorized by legislative or constitutional provision, to grant to any person the right to erect or maintain in a public street any structure or device, such as a news-stand, for private and exclusive use. (Georgia Court of Appeals, Magrill vs. City of Atlanta, 122 Southeastern Reporter, 641.)

City May Not Sell Property Dedicated to Specific Use

Holding that defendant city was not empowered to sell land dedicated on its plat as a public square or a market square, the Kansas Supreme Court lately said in the case of State vs. City of Manhattan, 225 Pacific Reporter, 85:

"When public grounds, such as market squares and public squares, are dedicated by city plat, the legal title vests in the county in trust for the public, while the possession, dominion, and control are vested in the city. . . . It is also well established that when property is so dedicated for a specific purpose it cannot ordinarily be put to any other use. In 18 C. J. 127, it was said (section 167):

"'If a dedication is made for a specific or defined purpose, neither the Legislature, a municipality, or its successor, nor the general public has any power to use the property for any other purpose than the one designated. . . .' Franklin County vs. Lathrop, 9 Kan. 453.

"Inasmuch as there are three parties interested in every dedication—the dedicator and his representative, the general public, and the property owners with special interests such as owners of lots abutting on streets, no one of them without the consent of the others can change or destroy the use. . . . The Legislature has no power as against abutting owners or as against the original dedicator to devote the property to a use other than that for which it was dedicated, nor to sell the property and use the money for other purposes. . . .

"Where the city by purchase or condemnation proceedings acquires the title to real property, the Legislature can authorize its disposition."

Elements Which an Improvement Must Possess in Order to Justify Local Assessments

Seldom has the fundamental law governing the levy of local improvement assessments been more clearly and concisely stated than in the following language used by the California District Court of Appeals in the case of Federal Construction Company vs. Ensign, 210 Pacific Reporter, 536:

"Special benefits to the property to be assessed, that is, benefits received by it in addition to those received by the public at large, is the equitable and just foundation upon which local assessments rest; and, under our system of government, no assessment can be made upon any land on any principle other than that of special benefits actually or presumptively received.

"The elements which an improvement must possess in order to justify a local assessment based on the theory of benefits are certainly two in number, and possibly three. The first is that the improvement must be a public one; that is, it must be one which confers a general benefit upon the public at large, and which, therefore, the public, acting through its government, may construct without the consent of the particular individuals affected. . . . The second element essential to a valid local assesment is that the improvement must confer an especial and local benefit upon the property which is to be assessed. It is possible that it will suffice if, from the nature of the work, the property can be presumed to have received an especial benefit. . . . Unless, however, there be some local benefit, actually or presumptively received, the improvement may be public in character, so that the expense thereof may be borne by general taxation, but a local assessment, levied on the basis of benefits, cannot be made therefor, since the underlying principle of such assessments is that the improvement, aside from the mere general advantage resulting to the community at large, will result in some special benefit to the particular lot owners whose lands are assessed—

a special benefit to the assessed lands in which the general public does not participate. . . . It is, however, no objection to the validity of an assessment that the improvement benefits the public, provided it also confers an especial local benefit upon the property to be assessed. Improvements of this sort necessarily must have a dual aspect—an aspect of general benefit to the public as well as one of peculiar local benefit to the lot owners. To validate the assessment, the general public benefit must be the only result of the improvement. A third element, which is insisted upon in some jurisdictions, is that of permanency."

Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources

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Recent Zoning Ordinances and Enabling Acts

WEST HARTFORD, CONN.—Ordinance, March 22, 1924
ARLINGTON, MASS.—Ordinance, May 15, 1924
BROOKLINE, MASS.—Amendment of Ordinance, March 20, 1924
MISSISSIPPI.—Enabling Act, 1924, Ch. 195
ENGLEWOOD, N. J.—Ordinance, August 7, 1923
ALBANY, N. Y.—Ordinance, April 21, 1924
DOBBS FERRY, N. Y.—Ordinance, April 30, 1924
GREENBURGH, N. Y.—Ordinance, May 2, 1924
CINCINNATI, OHIO.—Ordinance, April 3, 1924

Recent Zoning Decisions

CALIFORNIA.—Zahn and Ross v. Board of Public Works of City of Los Angeles, District Court of Appeals, Second Appellate District, March 20, 1924.—Petition for mandate for permit to construct a store in a district on Willshire Avenue, which by the zoning ordinance was devoted to residential structures; the store to be located within less than fifteen feet of the street line, contrary to the setback provisions of the ordinance for the district. *Held* that the character of the district is such that it is unreasonable to exclude business from it; and that in this case the setback provisions "have no reasonable reference to the safety, health, morals or general welfare of the people at large." While the Court is careful to say that it does not "express the opinion that setback ordinances are under any and all circumstances unauthorized by the police power," it is difficult to avoid the conclusion that the Court regards setbacks so created with decided disfavor.

MISSOURI.—Tureman v. Ketterlin, Supreme Court, October Term, 1923.—Suit to enjoin the location and operation of an undertaking establishment in Kansas City in a residential neighborhood, on the ground that it was a nuisance, and violated an ordinance forbidding such location within one hundred feet of a residence. *Held* that such an establishment, although not necessarily dangerous as a spreader of disease and a nuisance *per se*, is unpleasant and a nuisance in a residential neighborhood on account of its depressing influence. For this reason the injunction is granted, no opinion being given as to the validity of the ordinance.

NEW JERSEY.—Allen v. City of Paterson, Court of Errors and Appeals, 123 Atl. 884.—The judgement in the Supreme Court (121 Atl. 610) sustaining the power of boards of appeal, appointed by municipalities, to vary zoning ordinances where the strict letter of the ordinance would work hardship or injustice, affirmed; no opinion being expressed with regard to the validity of the ordinance, because the question was not properly raised below.

NEW JERSEY.—Cooper Lumber Co. v. Dammers, Building Inspector of Borough of Rutherford, Supreme Court, March 22, 1924. Application for mandamus to compel the building inspector to issue a permit for the erection of industrial structures in residential district created by the zoning ordinance on the banks of the Passaic River. *Held* that the governing body of Rutherford in placing the property in question in a residential district "did not give that reasonable consideration to the character of the district called for by the act" of the Legislature under which the zoning was done. Mandamus awarded.

NEW JERSEY.—State ex rel. Ignaciunas v. Town of Nutley, Court of Errors and Appeals, May 19, 1924.—The decision of the highest court of the state sustains the court below in commanding the building inspector to issue a permit for the erection of a combined dwelling and store in a district which by the zoning ordinance of the town was devoted exclusively to residence. The court below assumed that the ordinance in question was authorized by the statute, and held the statute void in so far as it permitted the town to prohibit Ignaciunas from erecting the residence and store on his lot in a residential district. The upper court does not find it necessary to consider this fundamental question, for this reason: The law authorizes only such regulations as are "designed to promote the public health, safety and general welfare." In the judgment of the upper court, the regulation in question is not designed to any of these ends, and is therefore not authorized by the statute. In spite, however, of the fact that the decision does not, in terms, declare void the New Jersey zoning statutes in so far as they attempt to create districts from which business is excluded, it is difficult to see how any ordinance can be drawn under them for that purpose which, in the light of this opinion, would be valid.

NEW YORK.—Harris v. Village of Dobbs Ferry, Appellate Division, Supreme Court, Second Department, reported in *New York Law Journal*, April 18, 1924, page 268. The statute authorizing the zoning of villages provides that it shall be done "in accordance with a well-considered plan." The

Legislature did not intend that such restrictions on the property owners' rights should be haphazard, selecting one street or another from time to time. *Held,* affirming the judgment below, that the provisions in question, evidently not being in accordance with a well-considered plan, were void.

New York.—Lees v. Cohoes Motor Car Co., Inc., 122 Misc. 373.—An ordinance providing that no gasoline tank shall be erected within 1,000 feet of the place where people live and sleep, since it would practically forbid the erection of such a tank within the city limits, is unreasonable and unconstitutional.

New York.—Palmer v. Mann, Tenement House Commissioner of the City of New York, 237 N. Y. 112.—The highest court in the state sustains the court below in holding that the amendment to the zoning resolution of New York City reducing the height limit on upper Fifth Avenue from 150 to 75 feet was illegally adopted.

New York.—Barker v. Zwitzer, Inspector of Buildings of the City of New Rochelle, Supreme Court, Appellate Division, May 2, 1924.—An ordinance limiting by districts the number of families per acre is void, for the reason that it is not authorized by the provisions of the General City Law (Subd. 24 and 25 of Sec. 20, being Laws 1917, Ch. 483) providing for zoning. In the opinion the Court says: "It is not attempted, and indeed at this late day it would be idle to impair, whittle down or set at naught 'zoning ordinances' which in no wise transcend constitutional limitations or the power delegated by the Legislature. Such ordinances . . . are a lawful exercise of police power."

Pennsylvania.—In re permit to American Reduction Co. to erect an incinerator.—Common Pleas Court, Allegheny County, February 12, 1924, reported in Municipal Law Reporter, Vol. 15, No. 8 (April, 1924), page 182. The applicant, denied permission to erect its incinerator by the Superintendent in a light industrial district, was granted the right to do so by the Board of Appeals, subject to certain conditions. *Held,* that the state zoning enabling acts in question are constitutional; and that the statutory provision giving the Board of Appeals power to vary the ordinance in accordance with its spirit, to avoid hardship, is valid, being a delegation not of legislative but of administrative function.

Tennessee.—City of Memphis v. Gianotti, Supreme Court, Western Division, March 29, 1924. —The ordinance of the city making it unlawful to construct or maintain a junk shop or junk yard in any block or within two hundred feet of any block on any street in the city on which two-thirds of the total number of structures on both sides of the street in such block are used exclusively for residential purposes, is a reasonable and valid exercise of the police power. This case is important as one of the few cases in the state of Tennessee bearing upon the question of the validity of zoning.

Recent Zoning Literature

Zoning Unsubdivided Areas.—The Report of the Zoning Commission on the zoning of West Hartford, Conn., by the city planner, Robert Whitten, of Cleveland, Ohio, in addition to the outline of the recently adopted zoning ordinance for the town, contains a valuable suggestion looking toward the planning and zoning of unsubdivided areas under the supervision of a board to be given both planning and zoning authority.

The Nutley, New Jersey, Case.—Under date of May 27, 1924, Edward M. Bassett, Esq., has written the New Jersey State League of Municipalities a letter suggesting steps that may well be taken in that state to make a new start under the general zoning enabling act recently enacted by the Legislature superseding the laws passed upon by the Nutley case. This letter, with related material, has been published as a pamphlet by the Committee on Regional Plan of New York and Its Environs, 130 East 22nd Street, New York City. Mr. Bassett suggests that (1) the New Jersey municipalities should repass their zoning ordinances with such changes as will comply with the requirements of the new act; (2) the city attorneys of the municipalities should be alert to ask the courts to refer any litigant attacking the constitutionality of the new law or ordinances, to the board of adjustment on the ground that an applicant for a permit must first exhaust the remedies given him by law before he can attack constitutionality. This, he says, in his opinion, "is a better lead . . . than a constitutional amendment."

This pamphlet will also be of interest in the states other than New Jersey where decisions have been adverse to zoning under the existing statutes and ordinances.

Zoning Bulletin of Department of Commerce, Washington.—The Department of Commerce issued a bulletin last May. It is occasioned by the publication of the Standard State Enabling Act in pamphlet form, and contains a history and an explanation of the act.

Colorado	Acts of 1923, Chapter 182
Delaware	Laws of 1923, H. B. No. 29
Illinois	Laws of 1923, H. B. No. 478
Iowa	Laws of 1923, Chapter 34
Nevada	Laws of 1923, Chapter 125
New Jersey	Laws of 1924, Chapter 146
North Carolina	Laws of 1923, Chapter 250
North Dakota	Laws of 1923, H. B. No. 8
Oklahoma	Laws of 1923, H. B. No. 204
Pennsylvania	Laws of 1923, Acts 33, 93 and 382
Rhode Island	Laws of 1923, Chapter 2315
Wyoming	Laws of 1923, Chapter 78

Model Enabling Act for New York Region.—A form of state enabling act for zoning has been prepared by Edward M. Bassett, Esq., who is a member of the Advisory Committee on Zoning of the Department of Commerce, which prepared the model act. This act has been published as a pamphlet by the Committee on Regional Plan of New York and Its Environs for use in the three states—New York, New Jersey and Connecticut—into which the region extends. The act, for the most part similar to the standard act, varies from it in containing fuller provisions with regard to penalties and enforcement and in a few details to bring it into conformity with late judicial decisions.

Constitutionality of Zoning.—Alfred Bettman, of Cincinnati, has written an article for the May, 1924, number of the *Harvard Law Review* on the "Constitutionality of Zoning." The article has been published also in the *New York Law Journal* issues of May 26, 27 and 28. It not only contains classified citations of authorities, but is in addition a most valuable contribution to the literature of the subject.

The Municipal Bond Market

By Sanders Shanks, Jr.

Editor, *The Bond Buyer*

STATE and municipal borrowing during the first half of 1924 has not fallen off in volume, as was generally expected. On the contrary, the output of new issues has been at the rate of over $100,000,000 a month, or somewhere in the neighborhood of $1,250,000,000 a year.

From the bond market standpoint, these public borrowers have fared pretty well. During the early months of the half-year period, prices were firm, in spite of the prospect for revisions in the income tax schedule which might greatly detract from the tax-exemption feature of municipals. The level of prices in January, February and March was such that the largest cities and states with the best credit could sell 4¼ per cent bonds at par, smaller places issued 4½'s and 4¾'s, and towns and districts were borrowing at 5 per cent.

In April the market began to show a rising tendency and it soon became evident that a real boom in bonds was on. The $67,400,000 New York City offering in May went over with such a bang that there was no longer any doubt as to which way things were going. May was an active month in the bond business and closed with prices several points above the January to March level. June has seen the same active trading, still higher prices and an apparently unsatisfied demand for state and municipal bonds of all sorts and grades coming from banks, insurance companies, estates, business corporations and, of course, the wealthy private investor subject to up to 48 per cent income taxes under the new revenue law and, hence, desiring nothing but a tax-exempt investment.

Bonds are enjoying a market which is merely the natural result of a recession in general business activity. The banks and all other reservoirs of capital have an unusual amount of money to invest in bonds because the demands of ordinary business are abnormally small. As all these banks rush into the bond market and compete with one another, they force prices up.

Municipal bonds, always in great demand at a time like this because of their inherent safety (which is not impaired by a business depression), are also especially favored by the enactment of a new tax law which, if anything, increases the advantages of a municipal bond investment to a person subject to surtaxes.

The market's improvement, of course, is reflected in the prices paid for the bonds of the smallest towns as well as those of the metropolitan city or the state governments. The accompanying list of the more important offerings in the New York City bond market since the first of the year embraces a wide variety of issues and indicates the nature of the financing of all these different places as well as the terms on which the loans were arranged. Comparison of May and June items with those of earlier months discloses the extent to which prices have advanced.

IMPORTANT MUNICIPAL OFFERINGS IN THE NEW YORK CITY BOND MARKET DURING THE FIRST SIX MONTHS OF 1924

	Amount	Rate (%)	Due	Offered to Yield (%)
FeJanuary.—				
Rderal Land Bank	$60,000,000	4¾	1954/34	4.70
Bochester, N. Y.	4,200,000	4¼	1925–54	4.10–4.00
oston, Mass.	3,045,000	4 & 4¼	1925–69	4.15–4.00
Yonkers, N. Y.	1,766,000	4½	1925–64	4.10
Oyster Bay, N. Y., Jericho Water Dist.	1,485,000	4½	1929–43	4.20–4.15
Providence, R. I.	2,000,000	4¼	1964	4.25
Illinois	1,150,000	4	1937–38	.97
Kansas	3,500,000	4½	1949–52	4.30
St. Paul, Minn.	2,500,000	4¼ & 4½	1925–54	4.40–4.30
West Virginia	2,750,000	4½	1933–44	4.40–4.35
Kansas City, Mo., Sch Dist.	1,000,000	5	1941	4.50
North Carolina	5,000,000	4¾ & 4½	1963	4.50–4.45
Richmond, Va.	1,589,000	4½	1958	.99½
Travis Co., Tex.	1,140,500	5	1925–52	5.00–4.85
Pueblo Cons. Dist., Colo.	3,600,000	5	1926–55	5.00
Portsmouth, Va.	981,000	5	1954	4.90
Tonawanda, N. Y.	1,150,000	4½	1926–53	4.45–4.40
February.—				
Porto Rico	$3,000,000	5	1944–49–43	4.50
Minnesota	10,000,000	4¼ & 4¾	1944	4.45–4.35
Toledo, O., Sch. Dist.	1,000,000	5	1924–48	4.50–4.40
Los Angeles, Calif.	10,975,000	4½ & 5	1925–64	4.70–4.60
South Dakota	3,000,000	5 & 5¼	1934–44	4.80
Shreveport, La.	1,000,000	5	1925–64	4.80–4.75
Michigan	3,000,000	4 & 4½	1944	4.25–4.20
El Paso Co., Tex.	1,260,000	5	1954/39	4.85
Tacoma, Wash.	4,000,000	5½	1926–40	5.15–5.10
St. Louis, Mo.	2,000,000	4½	1929–44	4.50
Omaha, Neb.	1,000,000	4½ & 5	1929–39	4.60–4.50
Greensboro, N. C.	1,400,000	5	1925–64	4.80
Jersey City, N. J.	4,250,000	4½ & 4¾	1927	4.35
Minneapolis, Minn.	1,500,000	4½	1925–54	4.40–4.35
Ramsey Co., Minn.	1,000,000	4½ & 5	1925–44	4.60–4.50
March.—				
California	$2,350,000	4½	1925–45	4.375
Syracuse, N. Y.	1,890,000	4¼	1925–44	4.15–4.00
Nashville, Tenn.	900,000	5	1925–64	4.65
Louisiana Port Comm.	3,000,000	4¾	1933–73	4.75
Portland, Ore.	1,000,000	4	1935–54	4.50
Buffalo, N. Y.	2,195,000	4¼	1925–44	4.15–4.10
Alabama	5,000,000	4½	1936–42	4.60
[1] Kansas	2,475,000	4½	1949–51	4.35
Minneapolis, Minn.	1,120,000	4¾	1925–44	4.45–4.40
Providence, R. I.	1,000,000	4¼	1954	4.25
Monmouth Co., N. J.	1,208,000	4½	1926–54	4.30
Montclair, N. J.	1,000,000	4¾	1926–62	4.375
Flint, Mich., Sch. Dist.	950,000	5	1926–54	4.70–4.60
Dallas, Tex.	2,000,000	4½	1925–64	4.50
North Carolina	3,700,000	4½	(6 mos.notes)	4.25
Akron, O.	1,762,000	5 & 5½	1925–48	....
San Francisco	10,281,000	4½ & 5	1928–67	4.60–4.50
April.—				
California	$834,000	4½	1935–38	4.40
Kansas City, Mo., Sch. Dist.	1,000,000	4½	1943	4.375
Cuyahoga Co., O.	930,000	5	1925–49	4.50–4.40
Ramsey Co., Minn.	1,000,000	4½ & 4¾	1925–44	4.45–4.40
Michigan	2,000,000	4¼ & 5	1944	4.30–4.25
Champaign Co., Ill.	1,000,000	5	1925–43	4.50–4.40
Illinois	10,000,000	4½	1925–43	4.40–4.35
Hudson Co., N. J.	2,959,000	4½	1925–72	4.35
Passaic, N. J.	1,075,500	4¾	1925–64	4.40–4.375
Hawaii	2,285,000	4½	1954/44	4.40
New York State	45,000,000	4¼	1925–49	4.00
Kansas City, Mo.	3,300,000	4½	1942	4.28
St. Louis, Mo.	5,000,000	4½	1929–44	4.25
Milwaukee Co., Wis.	3,736,000	4¾	1935–44	4.55–4.50
May.—				
[2] San Francisco, Calif.	$6,500,000	4½ & 5	1931–64	4.50
Detroit, Mich.	19,680,000	4½ & 4¼	1925–54	4.35–4.25
[3] South Dakota	900,000	5 & 5¼	1934–43	4.75
St. Louis, Mo.	2,000,000	4½	1929–44	4.20
Los Angeles, Calif.	3,000,000	4¾	1925–64	4.55–4.00
Syracuse, N. Y.	2,175,000	4 & 4½	1925–44	4.00–3.75
Minnesota	10,000,000	4¼–4½ & 4¾	1954	4.45–4.35
Pasadena, Calif.	926,000	4½ & 5	1925–56	4.55–4.50
Westchester Co., N. Y.	4,664,000	4¼	1925–84	4.05–4.00

[1] Balance of $3,500,000 offered in January to yield 4.30%.

[2] Unsold balance of $10,281,000 offered in March to yield 4.60% & 4.50%.

[3] See offering of $3,000,000 in February to yield 4.80%.

	Amount	Rate (%)	Due	Offered to Yield (%)
Denver, Colo.	1,000,000	4½	1943–62	4.25
Missouri	3,600,000	4½	1925–44	4.20–4.00
Los Angeles, Calif.	1,000,000	5	1928–17	4.60
Amsterdam, N. Y.	1,020,000	4½	1925–64	4.15
Alabama	2,000,000	4½	1926–29	4.50–4.30
West Virginia	1,500,000	4½	1929–48	4.35
[4]Jersey City, N. J.	1,500,000	4½ & 4¾	1927	4.30
New Orleans, La.	1,200,000	4½	1926–67	99½
[5]Kansas	1,500,000	4½	1949–50	4.30
Cleveland, O.	6,522,000	4¾	1926–55	4.35–4.30
Oklahoma City, Okla.	1,600,000	5	1935–49	4.55
June.—				
Federal Land Bank	35,000,000	4¾	1954/34	4.625
Mississippi	5,816,500	4¾	1939–50	4.45
Illinois	9,000,000	4	1935–44	98
Mercer Co., N. J.	2,263,000	4½	1926–45	4.20–4.10
Los Angeles, Calif.	11,433,000	4½ & 4¾	1925–64	4.60–3.75
New York City	37,000,000	4¼	1974	4.15

[4] Balance of $4,250,000 offered in February to yield 4.35%.
[5] Originally offered in January, $3,500,000 to yield 4.30%.

	Amount	Rate %	Due	Offered to Yield (%)
New York City	30,400,000	4¼	1925–39	4.00–3.50
Long Beach, Calif.	1,000,000	5	1926–54	4.70
Duval Co., Fla.	1,500,000	5	1928–53	4.625
[6]North Carolina	1,000,000	4¾	1963	4.40
[7]Kansas	1,000,000	4½	1949–50	4.25
[8]San Francisco, Calif.	4,415,000	4½ & 5	1933–62	4.50–4.45
[9]St. Louis Mo.	1,000,000	4½	1934–44	4.15
[10]Los Angeles, Calif.	5,461,000	4½ & 4¾	1931–64	4.50–4.45
Dallas, Tex.	3,000,000	4½	1925–64	4.45–4.00
[11]Cleveland, O.	1,275,000	4¾	1930–54	4.25
Yonkers, N. Y.	1,540,000	4½	1926–39	4.10–3.65
North Carolina	10,000,000	4½	1934–63	4.35
Knoxville, Tenn.	1,120,000	4¾	1926–48	4.60–4.25
New Jersey	6,000,000	4¼	1939–54	102.25

[6] Originally offered in January to yield 4.50%.
[7] Originally offered in January to yield 4.30%.
[8] Originally offered in March to yield 4.60–4.50%, again in May to yield 4.50%.
[9] Originally offered in May to yield 4.20%.
[10] Originally offered first week in June to yield 4.60–4.50%
[11] Originally offered in May to yield 4.35–4.30%.

Hints, Helps and Happenings

93 Per Cent Reduction in Typhoid Death-Rate

A REMARKABLE decrease in the typhoid death-rate in Richmond, Va., during the period between 1906 and 1923, representing a reduction of more than 93 per cent, is discussed in a recent statement by Director of Public Welfare E. C. Levy.

For the 26-year period from 1880 to 1905, inclusive, Richmond's average annual death-rate from typhoid fever was 77.8 per 100,000 inhabitants. This rate has been steadily lowered, since the health department was reorganized in 1906, to the present low rate of 5.3 deaths per 100,000, which has been the average for the last five years. There were 11 deaths from this disease in Richmond in 1923. If the average rate for the years 1880-1905 had prevailed in 1923, there would have been 141 deaths from this disease last year.

Important Improvements Voted in Los Angeles

AT a special municipal election on May 6 the voters of Los Angeles approved an $8,000,000 bond issue for water-works, reservoirs and distributing system; $1,600,000 for equipping new police stations and installing a police telegraph system; $400,000 for a fire-boat; $1,000,000 for the construction and repair of bridges.

The proposition to incur a bonded debt in the sum of $21,000,000 for improvements and extensions to the municipal electric distributing system failed to carry, falling 2,650 votes short of the required two-thirds majority.

The adoption of a new charter for the city was approved by a vote of 126,058 to 19,287.

Differing Hose Threads Again Take Toll

ANOTHER recent instance of how intercommunity differences in threadings of fire hose and hydrants continue, in emergencies none too rare, to exact their costly and senseless toll, is reported in theApril number of *Safeguarding America Against Fire.* A fire in Farmington, Conn., in a detached residence valued at $75,000, having gotten beyond the control of the local fire department, aid was summoned from Unionville, Hartford and West Hartford.

"By the time that companies from these places had arrived, the fire had swept the roof and attic and was burning in the second story. A single line of hose, laid by the Farmington company, was supplied by the Unionville pumper, which could connect to the nearest thawed hydrant. But the hose connections of the Hartford and West Hartford departments would couple neither to the Farmington hydrants nor hose, which is of two kinds, some having a clutch coupling and some a screw coupling larger than those employed in the city or in West Hartford. The West Hartford firemen did, however, try to make a connection to the one line of hose in service, in order to get an additional stream, but could not solve the combination of three different couplings. After staying long enough to see the house burned to the ground, while their machines remained inoperative, the visiting firemen returned home, leaving the Farmington and Unionville forces to wet down the embers.

"Fire Chief Moran, of Hartford, stated on his return, that the city apparatus had special couplings with it which could have been attached to a hose or hydrant having the National Standard connection, but that the Farmington couplings and hydrant connection differed from the National, as well as from the Hartford, standard, thus rendering their adapters totally unusable."

Kansas City Appoints a Municipal Art Commission

TO the gradually growing list of cities having municipal art commissions, Kansas City, Mo., has been added. In commenting on this fact, *Kansas Citian,* the bulletin of the local Chamber of Commerce, said in its issue of May 27:

"Kansas City may be congratulated on the appointment of an Art Commission a few days ago by the Park Board, even if for the time being it has only advisory powers. It is probable that when the value of expert guidance in public structures has had a chance to be appreciated, the Commission will be given absolute power over the ornamental features of all public buildings, bridges, monuments, fountains, and such things.

"One of the ideas back of an art commission is that a bridge or viaduct, for instance, so often considered only from a utility standpoint, might well, and should, have some thought from an artistic point of view. The average bridge or viaduct is a blot against the sky, whereas, along different lines it would serve its purpose just as well and would add to, rather than detract from, the beauty of the neighborhood or landscape. The front of a fire station, the design of a memorial tablet or monument or park seat—anything into which the idea of beauty may be injected—should certainly have it. And how often have we seen a beautiful piece of statuary, a monument or a tablet improperly located. An art commission will guide in the setting of such things as well as in their first design. We are striving to make Kansas City attractive with beautiful homes and handsome structures, but how often do we encounter something that ruins the ensemble?

"So Kansas City has made in this first step towards a controlling art commission a step that has great possibilities, a sort of little brother, for the time being at least, to the City Plan Commission and the Park Board in their far-reaching work; and Kansas City in this way has joined the ranks of America's most beautiful and progressive cities that have, and have had, art commissions for some years."

Mayor Enlists Volunteer Traffic Officers

AROUSED over the steadily increasing number of accidents in which "jitney" automobiles, carrying passengers for 10 cents, have played a part, Mayor W. A. Coleman of Columbia, S. C., has instituted a novel method of combating the evil.

The mayor has gone before the Chamber of Commerce, the Kiwanis, the Lions and the Focus clubs, and has asked their approval of a plan, which, in brief, is as follows: the Mayor appoints from the memberships of these organizations some 20 or 25 purely "volunteer" traffic officers, whose names are known only to the Mayor. These "officers" are supplied with stamped post-cards, and when they note a violation of the traffic regulations on the part of a jitney driver, they write on the card the time and place of the violation, its nature and the number of the license plate carried on the car. The card is mailed to the Police Department, and the offender summoned before the City Recorder, though the man who supplied the information is not required to attend the hearing. If the driver pleads guilty to the offense, he is fined; if he denies the charge, he is dismissed but is informed that he has been reported by a reputable citizen. The knowledge that some 100 men, unknown to them, are keeping tab on their operations, will, it is believed, have a decidedly sobering effect on jitney drivers who may be inclined to be careless.

Street-Car Fares in Cities of 25,000 Population or More

OF the 288 cities in the United States now having a population of 25,000 or more, only 13 which originally had a five-cent fare still retain the old rates without modification. The fare increases in the other 275 cities range from the elimination of reduced rate tickets, costing less than five cents per ride, to cash fares as high as ten cents. These figures are made available by data gathered by J. A. Millon, of the Statistical Department of the American Electric Railway Association, and published in the June number of *Aera*. There are now 72 of these cities which have a five-cent cash fare; 42 with a six-cent fare; 65 with a seven-cent fare; 46 with an eight-cent fare; 2 with a nine-cent fare; and 61 with a ten-cent cash fare. Mr. Millon's article gives details for the various cities as to children's and students' fares, tickets, and other special rates. Information is also given for many of the cities as to franchise restrictions and jurisdiction over rates.

The House by the Side of the Road

With apologies to Sam Walter Foss

Oh, I live in a house by the side of the road,
  Where the race of trucks goes by—
The trucks that are big, and the trucks that are small,
  With boxes and bales piled high.
I cannot sleep through the din and the jar,
  Nor rest, or ponder, or plan—
Though I bought my house by the side of the road
  To be a friend to man.

I see from my house by the side of the road,
  By the side of the highway to town,
A tenement towering high in the air,
  A laundry of Chinese so brown,
And garages perfuming the air with their gas;
  If these are not put under ban,
Can I live in my house by the side of the road,
  And be a friend to man?

I have lived in my house by the side of the road
  Where the trucks go tearing by,
Where the stores crowd in and apartments loom up,
  And shut off my view of the sky.
I've stood all the bustle and racket and din,
  As long as a fellow can.
I must move from my house by the side of the road
  Or I'll ne'er be a friend to man.

—HARRIET PAIGE KIMBALL.

[EDITORIAL NOTE—The atmosphere of zoning and town planning has so permeated the household of the Chairman of the Planning Board of Dedham, Mass., that one member of the family, a college girl, as an exercise in English, evolved this parody, which was used in the publicity campaign that resulted in the adoption of zoning by the town.]

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From the International Union of Cities

Items translated from "Tablettes Documentaires Municipales" by Stephen Child, 538 Merchants Exchange Building, San Francisco, Calif., to whom requests for further information regarding this source of civic documentation should be addressed

Rotterdam, Holland; Plans for Growth. 71.31 (492.61)

Plans have recently been made by architects Grandpré-Molière Vehaegen and Kok, for a considerable extension of the city of Rotterdam on the left bank of the Meuse. These plans have lately been presented to the City Council and received their approval. The project is divided into five sections, each of which is carefully studied, special effort being made to provide adequate means of communication.

Garden Villages for the Great Western Railroad of England. 71.312 (42)

The Great Western R. R. is encouraging its employees to create public-utility cooperative societies. These organizations have just built two garden villages near London. The first of these, at Acton, is to include 400 houses, 45 acres of land having been set aside for the project. At Hayes 60 acres have been allotted for this purpose, upon which 6,000 houses will be built. Of these two projects, 100 houses are now under construction. Rents are to be kept low, and in case of any surplus or profit this will be apportioned among the tenants. Ten other projects are under consideration near Bristol and Cardiff. The company buys the ground in each case and turns it over to the locally formed public-utility societies at 4 per cent interest. Ninety per cent of the estimated cost of the houses is also advanced at 4 per cent interest, and provision is made for reimbursing the company in 50 years.

A Garden Village in Holland. 71.312 (492.62)

The city of Amsterdam is undertaking the construction of a garden village called Niuewendam. This project will include 1,000 houses and is now so well along toward completion that steps are being taken for condemning more land in the near future for another village, Oostzaan. In the preparation of the plans, particular care is being taken with regard to means of communication, including auto busses and steam tramways.

Housing Groups Near Paris. 71.43 (44.361)

Apartment buildings to be rented at moderate rates are now under construction near the Porte d'Orleans from plans by architects Molinie, Nicod and Pouthie. The plans call for a group of what we should call high-class tenement houses, which are to be built by the city of Paris. The project will include ten buildings, each eight stories in height and each including seven hundred apartments of two to five rooms each. There will also be one hundred and fifty single rooms. In each building there will be an elevator and a service stairway. Great care has been exercised in the placing of the buildings so as to give the best lighting conditions and provide convenient access.

Spreading the Population by Arterial Roads Throughout England. 71.5 (42)

The Minister of Public Health, Sir William Johnson-Hicks, has issued a statement in which he expresses the hope that the main arterial roads now under construction for the purpose, among other things, of reducing unemployment may become part of a great development of automobile transportation; stimulating manufacturers to establish new works in the suburbs, so that the laboring population may be enabled to find conditions of work almost as healthy as those of laborers on the farms.

Art Commissions Discussed in Holland. 72 (492)

It is interesting to note that a committee of the Dutch Architectural Society some months ago prepared the following questions in regard to what we should call art commissions: First, have such commissions responded to expectations, and are they favorable to the development of architecture? Second, is it desirable to assign to such commissions a definite method applicable to all communities and, if so, what should be the relation of such commissions to the municipal administration? These questions were given wide circulation in Holland, and a summary of the important replies has recently been prepared including a statement by the doyen of Dutch architects, Berlage, and other prominent architects, artists and engineers.

Hastings, England, to Build a Music Pavilion. 72.581 (42.25)

The city of Hastings is going to build a music pavilion. This city has in the past few years made great development. The proposed concert hall, the construction of which has been decided upon, will seat 1,500 people. Its situation has been very carefully studied for the convenience of the community, and precautions taken to secure good acoustics. There will be provision also for dancing parties and other gatherings. The best methods of construction will be employed and the architecture will be attractive.

Studies for the Development of Stellenbosch, Cape Colony, Africa. 71.311 (687)

Interesting and comprehensive plans are being prepared for the development of the thriving South African town of Stellenbosch. These include water-supplies, highways, street cleaning, drainage, the treatment of waste water from distilleries; planning for the extension of the town, for better lighting systems and for a sewer system.

The Garden Village of Earswick, England. 71.43 (492)

Barry Parker, the principal author of the plans for Earswick, in collaboration with Raymond Unwin, has recently reported in regard to the different aspects of this well-known project, in particular the economies that have been realized in the construction of houses and streets. The purpose of Mrs. Rowntree in carrying out this project was to demonstrate that the design of the village and of its houses might be greatly improved without exaggerated expense.

A New Park at Vienna, Austria. 71.6 (772) (063)

A new park has just been planned for the people of Vienna on the area formerly known as the Waehringer Cemetery. By including surrounding gardens, the area has been increased from 52,000 to 63,000 square metres. The park includes a wading pool for children and a large playground. The old tombstones of the more famous people buried here have been gathered together in a grove.

Protection of Sites and Monuments, Birmingham, England. 71.9 (42.48)

The purpose of the Birmingham Civic Society is to stimulate public interest in the history of the city and to this end to preserve historic buildings and monuments, also to work for the embellishment of the city. One of the projects realized during the past year by the society has been the improvement of Muntz Park. A new park, 42 acres in extent, adjoining the Highway district of Birmingham has been bought by the Society.

An Architectural and Town Planning Exhibition at Brussels, Belgium. 72 (493.2) (064)

A very interesting exhibition has recently been held in the Palais d'Egmont, Brussels, emphasizing the new spirit in Belgian architecture and town planning—the first really modern exhibition of this kind held in Belgium. Interesting plans were shown of the new garden suburbs of Jumet, Kappeleveld, Boitsfort and Selzaetes—all near Brussels. Also architects' plans for both detached and row houses. The leading architects and town planners of Belgium were represented, Van der Swaelmen, Hoste, Eggericks, Bourgeois, Hoeben, Bodson, Rubbers—men who are making a place for these arts alongside the older arts of painting and sculpture.

A Project for 6,000 Houses for West Amsterdam, Holland. 33.332 (492.62)

Architect Van der Schaar has prepared plans for the above-mentioned great project which are now to be completely carried out by the city of Amsterdam. A special financial arrangement—a combination of mortgage and other bank loans, will permit the city to build these thousands of houses without involving its other financial engagements. The estimated cost of the houses is on an average 14,000 florins; of the developed lots an average of 3,000 florins. The enterprise is to be thoroughly controlled by the city authorities, who will determine types of houses and rents. The Government is to allow premiums of 900, 600 and 300 florins, depending upon the type of house, on condition that construction be rapidly advanced. The entire scheme has now been approved by the Council.

Municipal and Civic Publications

Prices do not include postage unless so stated

An Outline of Municipal Government.—By Chester C. Maxey, Ph. D., Associate Professor and Acting Head of the Department of Political Science, Western Reserve University. Doubleday, Page and Company, New York. 1924. XV + 388 pp. Charts. $3.00.

This volume is not only a text-book for classroom use in the study of municipal government, but also an outline which serves to clarify the subject for the general reader. It has grown out of the author's teaching experience, in which he was accustomed to furnish for the students primary source materials and to conduct observations of municipal government in operation, organizing the information thus gained, by lectures and classroom discussions. As the course developed, such a volume as this became essential. Municipal Government, Municipal Functions, and Municipal Finance are the large divisions of the subject as here presented, and under these are the following chapters: The City as a Problem in Government; The Relation of the City to the State; The Structure of City Government; Municipal Politics; The Civil Service; The Political Disintegration of American Cities; The Administration of Justice; Public Safety; City Planning; Public Works and Public Service; Municipal Utilities; Public Welfare; The Educational System of the City; The Financial Disabilities of Cities; Municipal Revenues; The Municipal Budget; Municipal Purchasing; Municipal Indebtedness.

Readings in Municipal Government.—Edited by Chester C. Maxey, Ph. D. Doubleday, Page and Company, New York. 1924. XIV + 627 pp. $3.50.

Source material on the major problems of municipal affairs, arranged in chapter groups to accompany "An Outline of Municipal Government," notice of which is given above.

Hand-Book of Fire Protection.—By Everett U. Crosby, Henry A. Fiske, and H. Walter Forster. Seventh edition. 1924. D. Van Nostrand Company, New York. XXVIII + 900 pp. Illustrated. $4.00.

The latest edition of this standard hand-book contains new and improved text and better illustrating, cross-referencing and indexing. It serves as a means of education in fire prevention and protection and as a reference book for specialists in this field and for those who wish to make occasional use of such material. A large amount of valuable and detailed information is clearly presented under the following divisions: General Information; Causes of Fire; Spread of Fire; Construction for Special Occupancies; Extinguishment of Fire; Miscellaneous (Egress Facilities, Protection of Records, etc.); Tables of Data for Fire Protection Engineers.

Moss' Chicago Police Manual.—Compiled by Stewart P. Moss, Sergeant of Police, 20th District, Chicago. T. H. Flood & Co., Chicago. 1923. Handy size. 270 pp. $2.00, postpaid.

This book defines crimes, felonies and misdemeanors familiar to police officers, and states the proof necessary to convict, and the punishment therefor; it also gives Illinois state statutes and Chicago city ordinances regarding the carrying and sale of deadly weapons, the gaming laws, and the city ordinances, with penalties, applicable to the police departments. Definitions of legal words and phrases are given, the functions of the courts in Cook County, Illinois, the duties of state, county and city officers, and other information which police officers in Chicago should have. Corrected to June 25, 1923.

Problems of Child Welfare.—By George B. Mangold, Ph. D., Director, Missouri School of Social Economy. Revised edition. The Macmillan Company, New York. 1924. XVIII + 602 pp. $3.00 postpaid.

Only the social problems that directly and immediately concern children are dealt with in this volume, which has been brought up to date in line with the general program and philanthropic machinery of child welfare work that have been developed in the last ten years. The statistical tables that were no longer useful have been revised. The subject is handled under the following large divisions: The Conservation of Life; Health and Physique; Training and Education; Child Labor; Juvenile Delinquency; Problems of Dependent Children. The information given in each of these sections is detailed and specific, and is supported by accounts of what is actually being done in many places to further progress in this great field.

Power Station Efficiency Control.—By John Bruce. Isaac Pitman & Sons, Ltd., London and New York. 1924. XIII + 244 pp. Diagrams, tables and illustrations. $3.75.

A well-prepared, interesting treatise, not of a highly technical nature, discussing the salient factors influencing the efficient operation of steam power-plants. The methods of efficiency control outlined are those used in the generating stations of the Glasgow Corporation, Electricity Department. The book takes up the various elements of a power-plant, including boilers and boiler-room efficiency, combustion of coal, boiler-room measurements, recording, tabulating and analyzing operating results, boiler-feed water, turbine-room efficiency, condensers and auxiliaries, circulating water and condenser constants, electrical measurements, auxiliaries and heat-balance control, and a modern example of heat-balance control. The volume closes with an analysis of power-station records by R. H. Parsons and a bibliography of English power-plant literature.

School Bonds.—By John Guy Fowlkes, Ph. D., Associate Professor of Education, University of Wisconsin. The Bruce Publishing Company, Milwaukee, Wis. 1924. 177 pp. Tables, forms, diagrams. $2.25.

The author of this book believes that the educational laws of each state should include the principles of issuing school bonds, and he has written the book as a guide for boards, superintendents and state departments of education that have in charge the issuance of such bonds. The volume can also be used as a text-book in courses in educational administration. Each chapter is definitely summarized. The first four are: "How Can School Building Programs Be Financed?"; "What Is a School Bond?"; "Trends in School Bonded Debt Assumed Annually"; "Justifying a School Bond Issue." The next three deal respectively with retiring, marketing and recording school bonds, and the last chapter is entitled "Some Functions of State Departments of Education in Issuing School Bonds."

Principles of Real Estate Appraising.—By John A. Zangerle. The Stanley McMichael Publishing Organization, 1222 Prospect Avenue, Cleveland, Ohio. 1924. 358 pp. Illustrated. $5.00.

The author of this book has been for many years the Auditor and Assessor of Cuyahoga County, Ohio, of which Cleveland is the county-seat. He discusses the theory and practice of valuing land and buildings, and summarizes the important and authoritative data contained in the various appraising systems now in use. By standardized tables, values can now be definitely computed after a standard unit foot value has been determined. This applies to irregularly shaped lots and other puzzling problems. The book is designed, first, to give a fundamental knowledge of assessing practices; second, for students in real estate board and educational courses; third, to aid the appraiser of leaseholds involved in inheritance tax matters; and, fourth, to help the public assessor of real estate.

The Child: His Nature and His Needs.—Prepared under the editorial supervision of M. V. O'Shea, Professor of Education, The University of Wisconsin. The Childrens Foundation, Valparaiso, Ind. 1924. IX + 516 pp. Illustrated. $1.00.

This is the first important contribution of the Childrens Foundation, founded through an initial gift by Lewis E. Meyers, of Valparaiso, Ind., chartered by the state of Indiana in 1921 for the study of the child and the dissemination of knowledge promotive of the well-being of children. In a most interesting way the book makes available for parents, teachers, and others the best present-day knowledge of child nature, child well-being, and child education, in chapters contributed by authorities in the various sections of the field. Bibliographical data concerning these writers are given in the Appendix. A very valuable book, which should make instant appeal to those who need it most. The price of the book has been made merely nominal in order that it may have a very wide distribution.

Garden Apartments to Replace Slums.—"A Series of Articles Reprinted from the Evening World, Showing How New York Can Profitably Build Low-Rental Homes on High-Priced Land." April, 1924. 18 pp. Illustrated. (Apply to Andrew J. Thomas, Architect, 15 East 47th Street, New York, N. Y.)

Railroads of the Pittsburgh District.—A Part of the Pittsburgh Plan. Report No. 5 of the Citizens Committee on City Plan of Pittsburgh. October, 1923. 76 quarto pp. Views, maps, plans, tables. A study of existing facilities of all railroads, with recommendations for improvement. Special attention is given to freight-handling facilities and operating methods. (Apply to the Committee.)

Structural Safety in Building.—A report embodying the conclusions of the Joint Committee on Structural Safety representing architectural and engineering societies of the New York Metropolitan District. Adopted by the Committee April 3, 1924. 7 pp. (Apply to F. E. Schmitt, Engineering News Record, Tenth Avenue at 36th Street, New York, N. Y.)

Toronto Bureau of Municipal Research.—Tenth Annual Report, for year ending February 29, 1924. 19 pp. Charts. The Bureau is supported by private subscriptions from public-spirited citizens. (Apply to the Bureau, 189 Church Street, Toronto, Ont.)

Public Comfort Stations.—Report on Municipal Ordinances or Regulations Requiring the Establishment of Public Comfort Stations in Connection with Gasoline Filling or Service Stations. April, 1924. 12 mimeographed pp. Containing a letter of inquiry from Frederick Rex, Municipal Reference Librarian, Chicago, Ill., and replies from 20 cities; also a brief list of magazine articles on the subject. 10 cents in stamps. (Apply to the Municipal Reference Library, 1005 City Hall, Chicago, Ill.)

The Automobile Parking Problem.—Report No. 1017 prepared by the New York State Bureau of Municipal Information under the direction of a committee of the New York State Conference of Mayors and Other City Officials, Albany, N. Y., May 2, 1924. 5 pp. (Apply to W. P. Capes, Director of the Bureau.)

Town Planning in Great Britain.—The Procedure, Powers and Duties. 6 pp. in the Bulletin of the International Garden Cities and Town Planning Federation, March, 1924. (Apply to the Federation, 3, Gray's Inn Place, London, W. C. 1, London, England.)

The National Association for the Advancement of Colored People.—Fourteenth Annual Report, for 1923. A record of things accomplished for the Negro. 54 pp. (Apply to the Association, 69 Fifth Avenue, New York, N. Y.)

Local Impressions on P. R. in American Cities.—A collection of opinions from the 24 municipalities in the United States and Canada which have adopted proportional representation. 34 pp. in the April, 1924, issue of the Proportional Representation Review. 20 cents. (Apply to Proportional Representation League, 1417 Locust Street, Philadelphia, Pa.)

A Standard State Zoning Enabling Act.—Revised edition of an act under which cities may adopt zoning regulations. By the Advisory Committee on Zoning appointed by Herbert Hoover, Secretary of the Department of Commerce. 12 pp. 5 cents. (Apply to the Government Printing Office, Washington, D. C.)

The Reasonableness and Equity of Service and Minimum Charges.—By Morris Knowles and Nathan B. Jacobs. An address delivered at the twenty-eighth annual meeting of the Pennsylvania Water Works Association at Atlantic City, N. J., October 25, 1923. 24 pp. (Apply to Morris Knowles, 507 Westinghouse Building, Pittsburgh, Pa.)

Additional Water Supply for Flint, Mich.—Report made to the Board of Water Commissioners by George A. Johnson, consulting engineer. 95 pp. Maps, tables, charts. Recommending the development of additional supply from the Flint River. "If properly utilized, Flint River can be made to supply the water needs of Flint for more than a century to come." (Apply to George A. Johnson, 150 Nassau Street, New York, N. Y.)

Desirable Health Publicity and Methods of Obtaining it.—By Harold S. Buttenheim, Editor of The American City. 9 pp. in Public Health News of the Department of Health of the State of New Jersey, March-April, 1924. (Apply to J. C. Price, M. D., Director of Health, Trenton, N. J.)

Oklahoma City Water Department.—Special report giving a brief history of the development of the Water Department, including the method used at present to purify and soften the water. 1923. 24 pp. Illustrated. (Apply to C. E. Bretz, Superintendent of the Water Department.)

Traffic Regulations in Chicago.—Complete Digest of Traffic Regulations Governing Vehicles. Including state laws, ordinances of the city, park ordinances, and police parking rules. December, 1923. 32 pp., pocket size. Compiled by Edward J. Padden, Chief Clerk. (Apply to Al. F. Gorman, City Clerk.)

Metropolitan Planning for Future Transportation Requirements.—By J. Rowland Bibbins, consulting engineer, Washington, D. C. 9 pp. in the May, 1924, issue of Engineers and Engineering, published by the Engineers Club of Philadelphia. Covering: General Survey of Growth, Trends and Conditions; What Some Cities Have Done and Have Not Done; The Transportation Plan—What It Is and Is Not; A Program of Rational Sequence; Some Details of the Transportation Plan; Special Problems Not Yet Worked Out. (Apply to the publishers.)

Playgrounds Needed for Salt Lake City.—"500 Back-Yard Playgrounds Needed for the Children of Salt Lake City." Four plans of suggestive playground equipment for home use. 2 pp. issued by the City Recreation Department of Salt Lake City, Utah. (Apply to the Department.)

Directory of Agricultural and Home Economics Leaders, United States and Canada.—Sixth edition. Published annually in the spring, with supplements during the year. Official Directory of the Agricultural Extension Service, executives and personnel, including county agricultural agents and Home Economics teachers. Published by William Grant Wilson, member of The World Agriculture Society, 51 Chestnut Street, Cambridge, Mass. 1924. 672 + 32 pp. (Apply to the publisher.)

What Chambers of Commerce Can Do Toward the Settlement of Public Utility Problems.—By Delos F. Wilcox, Ph. D. Prepared for the American City Bureau's Summer School at Eagles Mere, Pa., 1919. 16 pp. Pocket size. Published January, 1924. Setting forth the need for (1) "a thorough corporate house-cleaning;" (2) the recognition and adoption by chambers of commerce of the doctrine of industrial democracy; (3) the giving up of hostility toward governmental agencies; and (4) the establishment by chambers of commerce of "an entente cordiale with the general public." (Apply to the author, 436 Crescent Street, Grand Rapids, Mich.)

Survey of the Junior High Schools.—Report of the committee appointed by William L. Ettinger, Superintendent of Schools, New York City, to make survey of the junior high schools of the city, December 18, 1923. 257 pp. Illustrated. (Apply to the office of the Superintendant, 500 Park Avenue, New York, N. Y.)

Public Improvements in Memphis, Tennessee, By Special Assessments.—Statement of the methods by which the city of Memphis accomplishes its local improvements, prepared by the City Clerk. 6 mimeographed pp. (Apply to C. C. Pashby, City Clerk.)

The Advantages and Accomplishments of the City Manager Plan of Government.—By E. E. Parsons, City Manager, Excelsior Springs, Mo. 20 pp. (Apply to the author.)

Better Transportation for Houston, Texas.—Reprint from the Electric Railway Journal of March 15, 1924. 8 quarto pp. Diagrams, tables. "Houston's long-standing difficulties being amicably adjusted." "Railway to be rerouted, service improved and more efficient operation obtained. Jitneys to be replaced with a coordinated bus and car system." (Apply to Electric Railway Journal, Tenth Avenue at 36th Street, New York, N. Y.)

Tax Exempting of New Housing.—Report of the State of New York Commission of Housing and Regional Planning, to Governor Alfred E. Smith and to the Legislature of the State of New York. March 14, 1924. 16 mimeographed pp. (Apply to Department of Architecture, Bureau of Housing and Regional Planning, Room 1819, 949 Broadway, New York, N. Y.)

Budget Facts and Financial Statistics of Multnomah County (Portland), Oregon for 1924.—Annual Report of the Tax Supervising and Conservation Commission of Multonomah County. 109 pp. Charts, tables. (Apply to C. C. Ludwig, Executive Secretary of the Commission, 200 Court House, Portland, Ore.)

Prevention of Accidents by Educational Methods.—By Arthur Williams, General Commercial Manager, The New York Edison Company, and President, The American Museum of Safety. Abstract of an address delivered before the Metropolitan Section of the National Electric Light Association in New York City, May 2, 1924. 7 mimeographed pp. "We must train ourselves to be constantly on the watch wherever we are, in a power-plant, factory, on the highways, or traveling by boat or train." (Apply to author, at the New York Edison Company, Irving Place and 15th Street, New York, N. Y.)

Fredericksburg, Va.—Annual Report on the Fiscal Affairs for 1923. (Apply to Levin J. Houston, Jr., City Manager.)

Buffalo's Text Book.—Adopted by the Department of Education for use in the public schools of Buffalo. Edited by John F. Barry and Robert W. Elmes. Published by Robert W. Elmes, Buffalo, N. Y. 1924. First edition. 224 pp. Illustrated. Outlining the commercial and industrial advantages of Buffalo, and its educational and recreational facilities, and emphasizing its historical achievements and natural resources, and its great possibilities for the future. (Apply to the publisher.)

The Water Supply System of Chicago.—By John Ericson, City Engineer of Chicago. April, 1924. 32 pp. Illustrated. This pamphlet has been prepared in order to have at hand a short and concise history of the water-supply system of Chicago and a statement of its present scope, to meet requests for information. Send 3 cents postage. (Apply to the City Engineer.)

Police Magazine, New York City.—Official publication of the New York Police Department, Vol. 1, No. 1, May, 1924. Conducted under the auspices of the International Police Conference. 70 pp. Illustrated. The principal contributions are by policemen themselves. This first number includes articles by Mayor Hylan and Commissioner Enright, and one by Chief Magistrate McAdoo on "The Battle for Traffic Regulation." The editor is Errol E. Hart. (Apply to Police Magazine, 487 Broadway, New York, N. Y.)

Recreation and Play in Elmira.—The work of Community Service cooperating with the Recreation Commission and the Park Board in three years of service is set forth in this interesting pocket-size pamphlet of 32 illustrated pages. (Apply to Z. Nespor, Executive Secretary, Community Service, 413 E. Water Street, Elmira, N. Y.)

Recreation Training School of Chicago.—This School is successor to the Recreation Department of the Chicago School of Civics and Philanthropy. Announcements for 1924-1925. 24 pp. Calendar, officers, instructors, courses and facilities. (Apply to the School at 800 South Halsted Street, Chicago, Ill.)

Directory of Social Agencies of New York.—Formerly the New York Charities Directory. Thirty-third edition. 1924. By Lina D. Miller. A reference book of social service in, or available for, Greater New York. Published by the Charity Organization Society, 105 East 22nd Street, New York, N. Y. LXXIV + 434 pp. $2. (Apply to the publishers.)

Voluntary Defenders Committee of the Legal Aid Society, New York City.—Report for 1923. 14 pp. In a recent statement the District Attorney said: "This committee has done more to maintain the ideal of the District Attorney, that no guilty person should escape prosecution and yet that no innocent person should be unjustly accused, than any other organization that I know." (Apply to Miss Alice Waldo, Director of Investigations, 32 Franklin Street, New York, N. Y.)

Tourist Camps.—Additions and amendments to the Sanitary Code of New York State, so as to cover all camps, including tourists' camps. 3 pp. in "Health News," the bulletin of the New York State Department of Health, for May 26, 1924. (Apply to Matthias Nicoll, Jr., M.D., Commissioner, State Department of Health, Albany, N. Y.)

Baltimore, Md.—Twenty-ninth Annual Report of the Free Public Bath Commission, for 1923. (Apply to Robert F. G. Kelley, Secretary and Superintendent.)

Chelsea, Mass.—Annual Report of the Water Commissioner, for 1923. (Apply to George Cassell, Water Commissioner.)

Concord, N. H.—Fifty-second Annual Report of the Board of Water Commissioners, for 1923. (Apply to Henry A. Rowell, Engineer of the Board.)

Evansville, Ind.—Annual Report of the City for 1923. (Apply to William H. Elmendorf, Mayor.)

Joliet, Ill.—First Annual Report of the Park District, organized July 8, 1922. (Apply to William G. MacLean, Superintendent.)

Kenosha, Wis.—Second Annual Report of the City, for 1923. With a report of the Gilbert M. Simmons Memorial Library. (Apply to C. M. Osborn, City Manager.)

Ogden, Utah.—Annual Report of the Auditor, for 1923. (Apply to Mary E. Farley, City Auditor.)

Salem, Mass.—Report of the Park Department for the Year Ending December, 1923. (Apply to Oliver Goodell Pratt, Superintendent.)

Springfield, Mass.—Forty-second Annual Report of the Health Department, for 1923. (Apply to Edgar H. Guild, M.D., Health Physician.)

On the Calendar of Conventions

July 14-18.—Montreal, Canada
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

July 14-26.—Evanston, Ill.
National School for Commercial and Trade Executives. Address: Robert B. Beach, Business Manager, Association of Commerce, Chicago, Ill.

July 20-26.—Palo Alto, Calif.
California Association of Commercial Secretaries. Annual convention and Summer School. Secretary, A. M. Robertson, Oxnard, Calif.

August 5-8.—Pasadena, Calif.
Pacific Coast Association of Fire Chiefs. Annual convention. Secretary, Jay W. Stevens, 205 Merchants Exchange Building, San Francisco, Calif.

August 7.—Saratoga Springs, N. Y.
American Association for the Promotion of Hygiene and Public Baths. Annual meeting. Secretary, J. Wells Wentworth, 297 Madison Avenue, New York, N. Y.

August 12-15.—Quebec, Canada
Dominion Association of Fire Chiefs. Annual convention. Secretary, Chief James Armstrong, Fire Department, Kingston, Ont.

August 15-22.—Salt Lake City, Utah
American Prison Association. Annual Congress. General Secretary, E. R. Cass, 135 East 15th Street, New York, N. Y.

August 19-21.—Mason City, Iowa
League of Iowa Municipalities. Annual meeting. Secretary, Frank G. Pierce, Marshalltown, Iowa.

August 19-22.—Buffalo, N. Y.
International Association of Fire Engineers. Annual convention. Secretary, James J. Mulcahey, City Hall, Yonkers, N. Y.

August 21-23.—Seattle, Wash.
Washington Association of Commercial Organization Secretaries. Annual convention. Secretary, F. W. Mathias, Commercial Club, Hoquiam, Wash.

August 23-24.—Moncton, N. B.
Union of New Brunswick Municipalities. Annual convention. Secretary, James King Kelley, 108 Prince William Street, St. John, N. B.

September 23-25.—Montreal, Canada
City Managers' Association. Annual convention. Executive Secretary, John G. Stutz, Lawrence, Kans.

September 29-October 3.—Boston, Mass.
American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, P. O. Box 234, St. Petersburg, Fla.

September 30-October 3.—Rochester, N. Y.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

October 6-9.—Washington, D. C.
The American Red Cross. Annual convention. Secretary, Mabel T. Boardman, National Headquarters, Washington, D. C.

October 6-10.—Monterey, Calif.
League of California Municipalities. Annual convention. Executive Secretary, William J. Locke, Pacific Building, San Francisco, Calif.

October 8-10.—Emporia, Kans.
League of Kansas Municipalities. Annual convention. Secretary-Treasurer, John G. Stutz, Lawrence, Kans.

October 14-17.—Augusta, Ga.
International Association of Municipal Electricians. Annual convention. Secretary, W. R. Arbuckle, Bayonne, N. J.

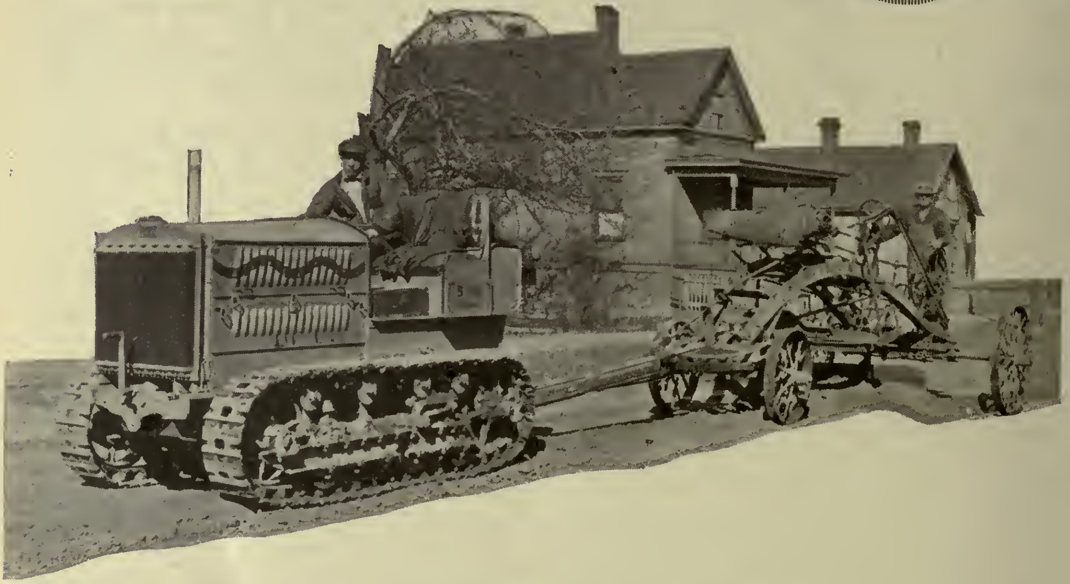
October 16-21.—Atlantic City, N. J.
Playground and Recreation Association of America. Annual Recreation Congress. Secretary, H. S. Braucher, 315 Fourth Avenue, New York, N. Y.

October 20-22.—Washington, D. C.
National Association of Commercial Organization Secretaries. Annual meeting. Secretary-Treasurer, Raymond B. Gibbs, Chamber of Commerce, Kansas City, Kans.

October 20-23.—Detroit, Mich.
American Public Health Association. Annual meeting. Secretary, Homer N. Calver, 370 Seventh Avenue, New York, N. Y.

November 10-12.—Harvard University, Cambridge, Mass.
National Municipal League. Annual meeting. Secretary, H. W. Dodds, 261 Broadway, New York, N. Y.

CATERPILLAR
Reg. U.S. Pat. Off.



"The *Backbone* of My Street Department"

That is what Allen P. Cowgill, Superintendent of Streets and Public Improvements, Lincoln, Nebr., says of the "Caterpillar."*

> "The service given by your Omaha Branch to the City of Lincoln during the past year has been excellent and up to the standard of your company, which I have never found surpassed. I have been particularly impressed with the usefulness of our 5-Ton "Caterpillars" for municipal work. Our tractors are used for snow plowing in the winter, maintenance with a 16-ft. maintainer after rains, and for heavy grading with an 8-ft. blade when the ditches are dry. I consider them the backbone of my Street Department."

Public officials in every state find the "Caterpillar" the most reliable and most practical power for street and road work the year round. We invite inquiries from city engineers, park boards and all other officials concerned in getting the most work done with the greatest economy to the taxpayers. *Back of every "Caterpillar" is Holt's positive guarantee of satisfactory performance.*

******There is but one "Caterpillar"—Holt builds it*

THE HOLT MANUFACTURING COMPANY, *Inc.*
PEORIA, ILLINOIS STOCKTON, CALIF.
***Eastern Division:* 250 W. 54th Street, New York**

"THE NATION'S ROADMAKER"

News and Illustrations

Items of Interest to City, Town and County Officials, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

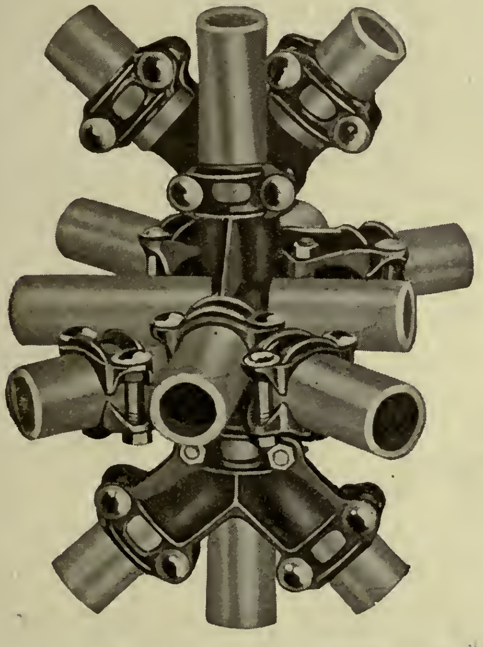
Interchangeable Pipe Fittings for Municipal Works

A complete line of structural pipe fittings, designed for use with common wrought iron or steel pipe in the erection of outdoor or indoor electrical switching equipment for the construction of racks, railings, bench or table frames, electric sign structures, playground apparatus, and tennis court and golf course barriers, has been placed on the market by the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. Pipe has long been recognized as a convenient material for structural work of this nature, since it is light for its strength, has a symmetrical cross-section which resists bending equally well in any direction, and can be cut easily and rapidly with inexpensive tools by inexperienced labor. The new line of pipe fittings makes possible the use of pipe for such work without the difficulties formerly encountered when ordinary plumbing fittings were used.

The Westinghouse fittings, which consist of a relatively few unit castings producing an almost endless variety of useful combinations, fulfill all the requirements for a successful clamp fitting. They are made of high-grade malleable iron with a minimum tensile strength of 50,000 pounds per square inch, are light in weight, compact, and neat in appearance. The only tools necessary for their use are a pipe vise and cutter and an open-end or socket wrench for each of the two sizes of bolts used.

The principal feature of the design of the new fitting is a ribbed yoke which clamps over the pipe with heavy carriage bolts to the other unit part. Various other unit parts consist of two or more yokes cast in a single piece through suitably formed connecting webs. Since the bolt spacings are uniform, parts designed for a certain size pipe are interchangeable with all others for that size. As the fittings are bolted up they yield slightly, because of the malleable characteristics of the iron, until they fit the pipe perfectly. The load necessary to slip a single fitting on a pipe is in excess of 3,000 pounds for 1¼-inch pipe, and 4,500 pounds for 2-inch pipe.

The bolts used in the new fittings are ordinary carriage bolts using the square shank under the head to fit into the square hole in the fitting, so that assembly can be made with a single wrench. For further convenience in assembly, hexagonal nuts are used. All bolts are galvanized by the hot dip process.



AN ILLUSTRATION OF THE POSSIBILITIES OF THE NEW WESTINGHOUSE PIPE FITTINGS

New Chemist with Weston & Sampson

Weston & Sampson, consulting sanitary engineers, 14 Beacon St., Boston, Mass., have announced that F. Wellington Gilcreas, late of the New York State Department of Health, is now in charge of their sanitary laboratory.

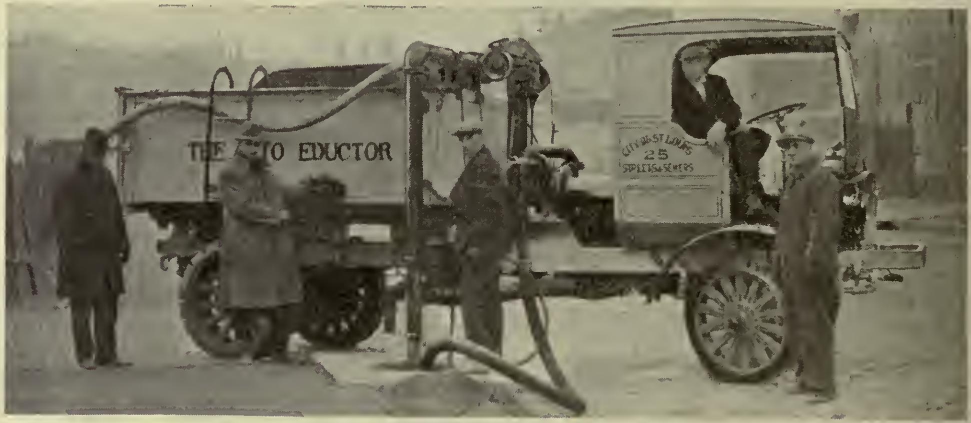
Draper Working on School Development

The Rutherford County School Board, Rutherfordton, N. C., has retained E. S. Draper, landscape architect and engineer, 11 East 5th Street, Charlotte, N. C., to make a survey and complete plans for the development of the grounds and athletic features for the new high school. White, Streeter & Chamberlain, Gastonia, N. C., are the architects for the school building.

New Offices for Worthington Mower Company

The Worthington Mower Company, Stroudsburg, Pa., has opened a new office on the corner of 40th Street, at 452 Fifth Avenue, New York City, in order to be better able to serve the growing demands of its business in the New York metropolitan district and the surrounding territory. This office is in charge of E. H. Worthington, Vice-President of the company, who will see that careful consideration is given to any communication regarding Worthington tractors, mowers or repair parts.

Autocar Equipment Unit Performs Almost Every Type of Municipal Task



4-cyl., 4- to 6-ton Autocar, equipped with Auto Eductor, owned by the City of St. Louis

Mounted on a 4-cylinder, 4- to 6-ton Autocar, this equipment unit makes it possible for the City of St. Louis to own one truck which will perform practically every type of municipal work efficiently and economically.

The Autocar illustrated above can be used for—

1. **Cleaning catch basins**
2. **Emptying cesspools**
3. **Flushing streets**
4. **Sprinkling streets**
5. **Emergency fire pumper**
6. **Spraying trees**
7. **General hauling**
8. **Snow plowing**
9. **Garbage and ashes**
10. **Flushing sidewalks**

Low cost of operation and more continuous operation assured by the Autocar system of Direct Factory Branches are distinctive Autocar advantages which daily save time and money for the City of St. Louis.

The Autocar Company
ESTABLISHED 1897
Ardmore, Pa.
Branches in 45 cities

Autocar

gas *and* electric trucks

EITHER OR BOTH – AS YOUR WORK REQUIRES

Plutonic Pavement

In order to meet an increasing demand for a granite paving block with all the wearing qualities of the standard granite blocks but without the refinement of cutting required by the specifications of the American Society for Municipal Improvements, blocks are now being made called Plutonic granite blocks. These blocks vary greatly in size, and lay from 25 to 40 to the square yard. They cost about one-half the price of the standard blocks and are used for city streets and state highway construction. The standard granite block pavement consists of a concrete foundation 6 to 9 inches deep, on which is spread 1 inch of sand or dry mortar for a cushion in which the granite blocks are set, after which the joints are filled with cement grout mixed one to one, or with a bituminous joint filler making a pavement 12 to 15 inches deep. By this method the granite blocks must be of uniform size, particularly as to depth, resulting in a much larger expenditure of labor than is required to produce blocks with more variation in size.

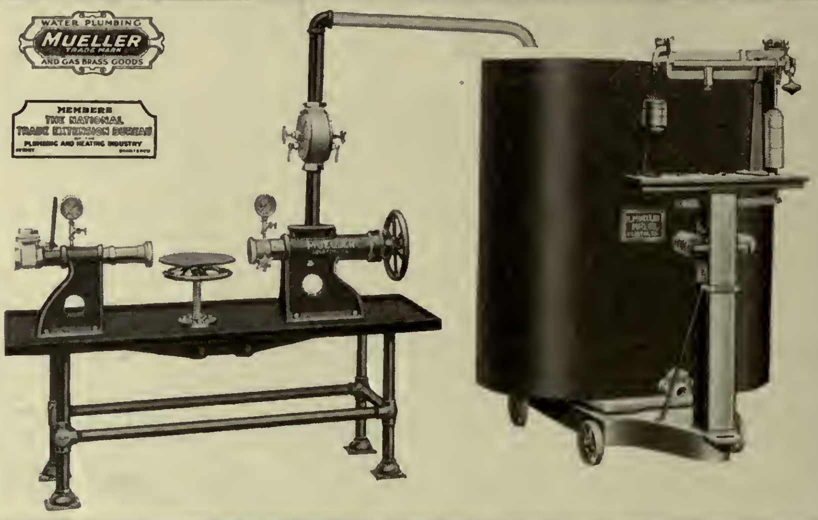
Plutonic pavement is constructed by spreading on the compacted subgrade 4 inches of concrete mixed dry, in which rectangular or Plutonic blocks from 4 to 6 inches in depth and 3 to 6 inches in width are set in such a manner as to bond thoroughly with the dry concrete. The blocks are rammed to a true surface, then sufficient water is applied gradually, by using a spray nozzle to wet the concrete enough to cause the initial set. This is immediately followed by the application of the cement grout as provided for standard granite block pavement. This method provides a concrete slab, faced with Plutonic blocks 9 inches in depth, which, in comparison with the standard granite block pavement of 12 to 15 inches in depth, where a concrete foundation 9 inches in depth is specified, results in a 40 per cent reduction in excavation, a 55 per cent reduction in concrete, the elimination of the sand or mortar cushion, and the elimination of about 50 per cent of the labor required to manufacture the paving blocks. The cost of the completed pavement by this new method ranges from 50 to 60 per cent of the cost of standard granite block pavement, and closely approximates the cost of reinforced concrete of equal depth.

In 1921 a short section of the Groton-Lowell Highway, a state, county, and town project, was completed in Westford, Mass., as an experiment, in accordance with specifications prepared by H. E. Fletcher, of Westford, and under his personal supervision. The location was in part on a bog and part on hard soil. No provision was made for drainage. The highway is used by large trucks loaded to the limit allowed by law, hauling from extensive quarries adjacent to the highway. There has been no indication of weakness or failure in the pavement due to this heavy loading.

LAYING A SECTION OF PLUTONIC GRANITE BLOCK ROADWAY NEAR LOWELL, MASS.

The city of Lowell, Mass., has for many years followed a comprehensive plan of street improvement, using block pavement as a standard. While the experimental highway was under construction in Westford, the work was examined and the process studied by Mayor John J. Donovan, City Engineer Stephen J. Kearney, the Board of Public Service, and the Lowell Chamber of Commerce. These officials and the organization have advocated the adoption of Plutonic pavement for the reconstruction of 1.3 miles of the Princeton Boulevard, a Federal Aid project, which is part of the state highway from Lowell to the New Hampshire state line, connecting there with the Daniel Webster Highway to the White Mountains.

Further information regarding this type of pavement may be secured from J. J. Tobin, Granite Paving Block Manufacturers' Association, 31 State Street, Boston, Mass.



MUELLER

Water Meter Tester

Good water works practice recognizes the necessity of testing meters before they are installed, as well as periodically thereafter—because an under-registering meter, especially in the larger sizes, means a heavy loss in revenue.

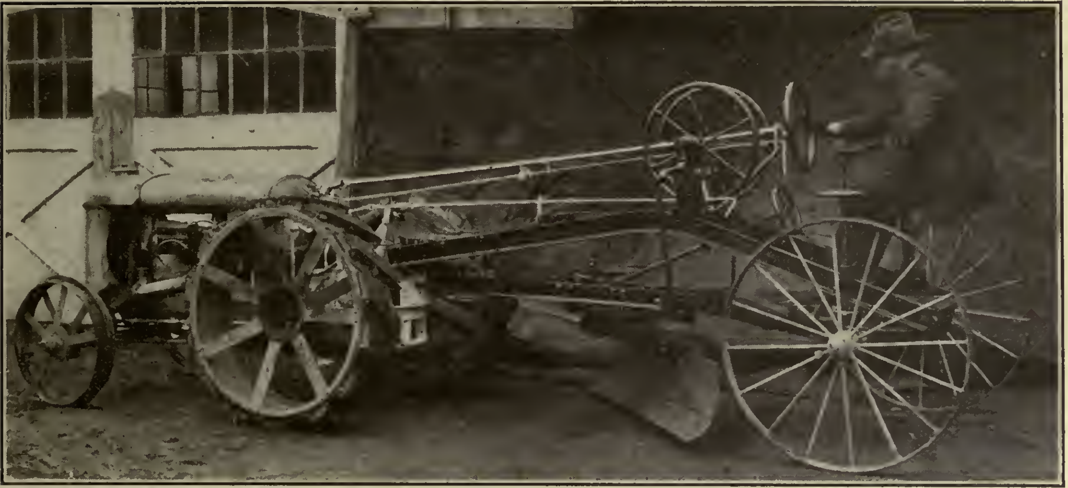
The saving effected by correcting one or two such meters will pay for the entire cost of the Mueller Water Meter Tester within a few months—and it goes on earning dividends indefinitely.

Mueller Water Meter Testers are strongly constructed—the table is cast iron, with wrought iron pipe legs and cast iron head blocks—all exposed parts are nickel plated. Materials and workmanship are first class throughout, and the entire outfit is fully warranted.

Write for complete descriptions and prices.

Mueller Co., Decatur, Ill. U. S. A.

145-149 W. 30th St., New York; 1072-76 Howard St., San Francisco; 2468 Hunter St., Los Angeles



NEW HAULING EQUIPMENT FOR A WELL-KNOWN GRADER

Special Attachment for Grader and Tractor

The Little Winner road grader, made by the Good Roads Machinery Company, Kennett Square, Pa., has been used for some time with two, three or four horses. The machine is of all-steel construction, weighs 1,590 pounds, and has a scraper blade 6 feet long. In view of the increasing use of the tractor as motive power for pulling road graders, an attachment has been specially designed for hooking the Little Winner grader to the Fordson tractor. By this attachment, it is possible for one man to control both the tractor and the grader, seated at the rear of the grader. The operating mechanism is very simple and convenient, as shown in the illustration.

New Portland Cement District Engineer

The Portland Cement Association, 111 West Washington Street, Chicago, Ill., has announced the appointment of L. N. Whitcraft, as District Engineer in charge of the Association's Philadelphia office, 1315 Walnut Street.

New Gamewell Officers

At a recent meeting of the Board of Directors of the Gamewell Company, Newton Upper Falls, Mass., V. C. Stanley was elected President and General Manager of the company. William Gellatly, who has been President, will act as Chairman of the Board of Directors. William Woolverton was elected Vice-President.

A New Precise Transit

A new precise transit has been developed and placed on the market by W. & L. E. Gurley, Troy, N. Y. The telescope is of completely new optical design, giving a clear and distinct vision without effort on the part of the observer. The increased diameter of the objective lens admits a flood of light, even under the most trying conditions, and the lens possesses a fineness of resolution which brings out the most minute detail. Greater convenience results from placing the objective focusing pinion on top of the telescope, and the platinum cross and stadia wires are brought into view by an eyepiece ring focusing movement. Additional features include the extra long sensitive level vial, symmetrically placed; the dust shield protecting the objective slide at all foci; the self-contained eyepiece slide centering device and bakelite eye cap.

The patented one-piece truss pattern of the standard has been redesigned to permit the use of a longer compass needle. It is rigid, since it is a single casting, securely held across the top by the telescope axis bar and fitted to it by multi-groove bearings, which automatically take up wear and eliminate end play. It is claimed that this standard will take more abuse than any other type and, if damaged by accident, can be readily repaired.

The graduations on the circle make this transit one of the most accurate made by this company. These transits have extra large vernier openings, admitting plenty of light. The flush glass vernier openings are close to the graduations, so that the error of parallax from oblique readings is reduced to a minimum. The whole transit is built as water-proof and dust-proof as possible.

A PRECISE TRANSIT FOR EVERY-DAY USE

Executive Avenue, Washington, D. C. at State, War and Navy Building. Tarvia-built in 1911, this street is still in excellent condition after 13 years of traffic.

© *National Photo*

This oldtime "thunderbus" is rust —but the street is still good

THIRTEEN years ago—when William Howard Taft was President—the Tarvia pavement was built on Executive Avenue, Washington, D. C. Soon a steady stream of lumbering oldtimers chugged along this famous street.

Those oldtime cars are junk. But—*after 13 years of continuous traffic*—the Tarvia pavement on Executive Avenue is still in perfect condition.

Tarvia streets can be kept good indefinitely at little cost. And in addition, a Tarvia pavement will not wave, roll or rut. A Tarvia pavement is skidproof because of its granular surface.

Thousands of Tarvia streets have proved that—for the money spent—Tarvia gives more miles and the most years of satisfactory service. On request we will gladly and promptly send you interesting booklets.

Tarvia

For Road Construction Repair and Maintenance

The Barrett Company

New York
St. Louis
Detroit
Minneapolis
Youngstown
Baltimore
Chicago
Cleveland
Kansas City
Salt Lake City
Milwaukee
Syracuse
Philadelphia
Cincinnati
Birmingham
Bethlehem
Toledo
New Orleans
Boston
Pittsburgh
Dallas
Lebanon
Columbus
Rochester

In Canada

THE BARRETT COMPANY, Limited

Montreal
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Toronto
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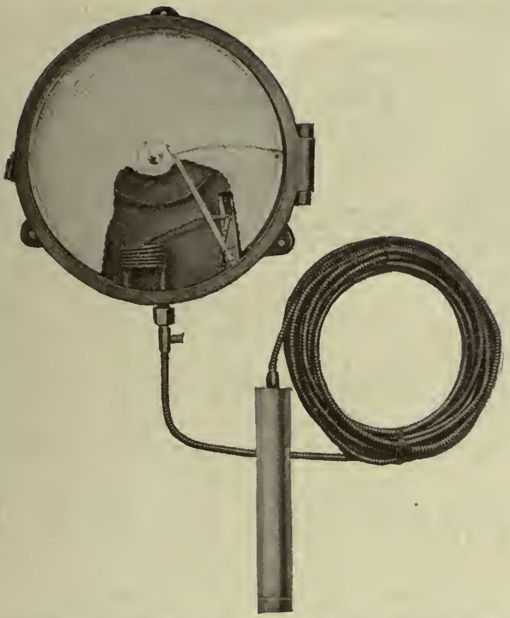
Halifax, N. S.



SECTIONAL VIEW OF RECORDING GAGE FOR WATER AND SEWAGE LEVELS

A Recording Water-Level Gage

Continuous records of water-levels in rivers, sewers, tanks, ponds, wells and irrigation systems are frequently necessary for the proper operation of water-supply systems of various types. The Sanborn water-level recorder, made by the Sanborn Company, 1048 Commonwealth Avenue, Boston 47, Mass., is a simple device adapted for use in outlying districts and where the water is dirty or in places where there are excessive variations in water-level.

An ink line traced on the one- or the seven-day chart shows the varying water-levels for the different hours of the day and night. The ranges of elevation for the charts are commonly 0-5, 0-10, or 0-20 feet, although much higher ranges, as 0-60 feet, and lower ranges, as 0-2 feet, may be provided. The part of the outfit that is in the water consists of a tube 1¼ inches in diameter and 12 inches long, called a compensator, that is open at the bottom end. Water tries to enter this tube, which contains air and is connected by a small capillary tube to the recording mechanism. As the water rises around the compensator, the air inside becomes compressed and the pressure is transmitted to the recording mechanism. It requires no float nor well and can be installed by two men in half a day.

It is claimed that temperature does not materially affect this recorder, since the compensator is not sealed otherwise than by water, and the medium to transmit the pressure from the compensator to the recorder is a small volume of air which is directly connected to the comparatively large volume within the compensator, and this last volume is commonly under water and not subject to wide variations in temperature. Tests have indicated that variations of temperature in air from room temperature to zero F, produce only a small percentage of error in the recording apparatus.

Grease, corrosion and obstructions that will put many float gages out of commission in a few months are said to have little effect on the Sanborn recorder when properly installed. In a sewer, the compensator should be placed close to a wall; in a river, on the side of a pier or a wooden post; in a pump well, on the side of a well and within a 2-inch pipe open at the bottom and containing a pin on which the compensator may rest. The recording gage may be placed above water-level or below it; in a warm office building or in an unheated building, or in a specially constructed box. Tubing from the compensator to the gage is of copper ⅛-inch in diameter and covered with a flexible brass armor protection. This may be placed within a pipe and underground or fastened to the wall and bent to conform to any irregularities.

Charts may be changed and the ink supply in the recording pen renewed once a week by a workman, but where several gages are in use and in one locality and a concentrated survey is being made, it is advisable to have one person attend to all of the recorders and by systematic attention obtain complete records for the time that the survey is desired.

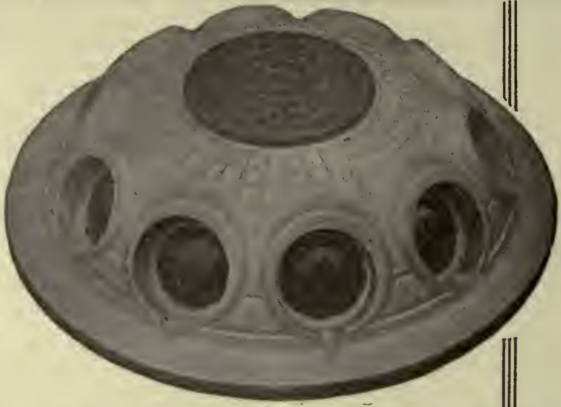
Centrifugal Cast Iron Pipe by the Sand-spun Method

At the convention of the American Water Works Association recently held in New York, there were displayed by a number of cast iron pipe manufacturers samples of the new sand-spun pipe, a most interesting development in the mode of manufacture of pipe to be used for water, gas, oil and many other purposes. The previous improved departures from old-established methods were when vertical casting in dry sand molds was adopted, in the middle of the last century. Prior to this time, pipe had been for many years cast on their side—or horizontally—in green-sand or non-dried molds with a core having a clay or loam coating. Under this operation, in spite of the core's being firmly held at each end, there was a tendency for it to float in the molten iron, making a casting which was uneven in thickness, and this movement of the core was difficult to prevent even with the use of chaplets or anchors.

This vertical or upright casting, insuring an equal thickness in the pipe, was at once popular, and the foundries using the old horizontal molds rapidly went out of existence. Many mechanical improvements in the details of running the sand into the molds and of handling the flasks have been developed, but these were only the ordinary and natural changes to be expected.

In carrying out this new sand-spun method the metal, at predetermined temperatures, is poured into a rapidly revolving sand-lined flask, against which the metal is cast without any chilling action. In addition to this, the centrifugal action of the mold, together with further manipulations thereof, serves to evenly distribute the molten metal throughout the length of the mold, thus securing a pipe of uniform thickness from end to end. The speed of revolution of the mold is such as to cause the metal to be exceedingly dense and solid, thus increasing its tensile strength by more than 50 per cent and making it tough and hard to fracture, yet without interfering in the least with drilling or tapping for service pipe or turning down or threading the exterior or interior for any desired purpose.

An important feature of this new sand-spun



This is a Life Insurance Policy---

Does YOUR City Hold One?

THE LEHMAN TRAFFIC GUIDE

may be called a life insurance policy for the protection of the public. The City (policy holder) purchases the Guide to insure its citizens (beneficiary) of absolute safety, thereby eliminating worry and preserving life by preventing traffic accidents.

To City Officials—It is your duty to see that your City has the best protection that money can buy. Insure your City with the Lehman Traffic Guide, a marker conspicuous by night or day that cannot be damaged by the heaviest loaded truck. The Lehman Traffic Guide is lighted by night by two bulbs which shine through ten 3½-inch ruby lenses. It stands but 5 inches high. It can be built to fit any size manhole, thus doing double duty as a traffic guide and manhole cover.

Don't Wait! Insurance tomorrow will not be of any assistance today in preventing some terrible accident.

ELKHART FOUNDRY & MACHINE CO.

SOUTH ELKHART AVENUE ELKHART, INDIANA

process, employing the sand-lined flask, is that pipe may be cast of any thickness, heavy or light. Another very important feature is that not only the bell but the spigot or bead end can be formed by this new method just as easily as it has always been formed by the old sand-cast method.

A refractory lining which is applied to the sand mold before casting, prevents the burning of the sand to the iron and avoids all scabbing. The sand in the flask is held in place by the centrifugal action. The refractory material which has been applied to the sand mold is of such a character that during the casting operation it becomes incorporated by a fusing action with the outer shell of the casting, thus forming a very desirable and attractive coating which prevents the formation of rust or corrosion and acts as a protection to the pipe. The finished pipe may, if desired, be coated with the regular Angus Smith or other tar varnish or coating, and can be coated on the interior with a cement or other lining material to prevent the formation of tubercules which are sometimes formed by certain characters of water or other fluids, and this coating preserves the coefficient of the flow of fluids through the pipe.

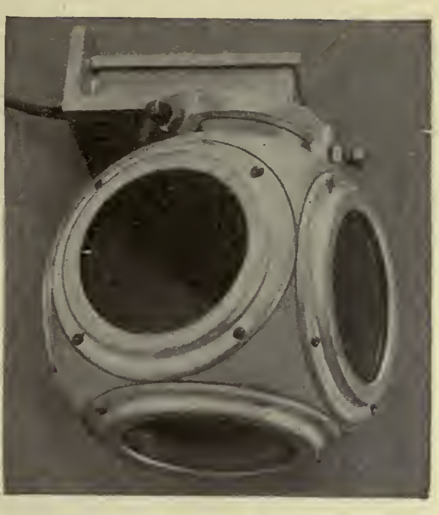
Cast iron pipe made by the new process in centrifugal sand-lined molds have been thoroughly tested in the usual way in hydraulic presses, individual pipe being tested to 2,400 pounds per square inch without showing defects. Bars made from the actual casting have shown over 30,000 pounds in tensile strain, and proportionate results in transverse and breaking tests.

This new sand-spun pipe is now being regularly made and marketed. Enlarged and up-to-date foundries are being built and old plants are being reconstructed for the installation of the new method, all of which will supersede the methods now employed. This new sand-spun method is protected by patents of a fundamental character which cover not only the process but the machinery and the product.

Large Shipment of Asphalt Tool Heaters

The accompanying illustration shows one of the largest shipments of oil-burning fire wagons for heating asphalt tools ever made at one time to a single user. Six of these machines, made by the Chausse Oil Burner Company, Goshen, Ind., were shipped to the city of Chicago on their third repeat order. The seventh machine shown in the picture was shipped to the city of Denver.

A SHIPMENT OF ASPHALT TOOL HEATERS



A LIGHT-WEIGHT FIVE-WAY TRAFFIC LANTERN

A Light-Weight Traffic Light

A cast aluminum body supporting various colored lenses for traffic warnings at street intersections, railway crossings, interurban car stops, bad curves, abutments of bridges and building exits, has been developed under the name, Universal Signal Lanterns, by the Nichols-Lintern Company, 7960 Lorain Avenue, Cleveland, Ohio.

The "Big Boy" No. 10 lantern is a large unit weighing only 25 pounds, with all parts made of cast aluminum or brass. It carries an 8-inch Corning Fresnel lens in ruby, green, yellow or clear glass. It has an adjustable receptacle for focusing the lamp, and a second socket in the base for reserve lamp and ground illumination. The "5-Way" Universal No. 20 lantern is a tightly built, dust-, vapor- and weather-proof unit with a cast aluminum body. It may be equipped with any combination of 4-inch Corning ruby, green, yellow, clear or blank lenses. These are also made in "1-Way" units.

New Dock and Terminal Company

The Dock & Terminal Engineering Company, 15 Park Row, New York City, and 4614 Prospect Avenue, Cleveland, Ohio, has acquired the engineering business formerly conducted by the Cleveland Dock Engineering Company. The personnel of The Dock & Terminal Engineering Company is equipped, by long and unusual experience, to render particularly advantageous service in the development of docks, piers, wharves and warehousing, as well as freight-handling facilities, for municipalities and industries.

The company has acquired licenses on favorable terms for the use of valuable patents covering concrete dock and pier work, including a license under the well-known Ferguson patent covering the "Cleveland" type of concrete dock or pier for municipal or industrial service.

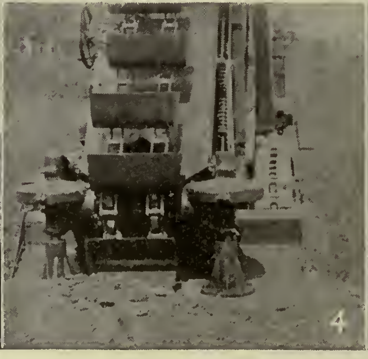
1—The street commissioner of Worcester, Mass., says his Barber-Greene Snow Loader takes the place of 100 men.

2—In summer Worcester converts its snow loader into a bucket loader. It loads a gravel car in one-fourth the time eight men previously required.

3—This Barber-Greene keeps 75 teams on the move and replaces 20 shovelers.

4—Close-up of the disc feeder. No shovel clean-up is ever needed.

5—A Barber-Greene handling a stock pile.



At one stroke—solving two serious municipal problems

Many cities are solving, at one stroke, two of their serious problems. In summer, they are greatly increasing the speed and efficiency of their street paving work. In winter, with the Barber-Greene Snow Loader, they are eliminating those traffic tie-ups that had always brought such heavy losses to business.

H. C. Page, Gen. Mgr. of the Worcester Traction Co., Mass., said: "We are greatly pleased with our Barber-Greene Snow Loader. In the summer, we equip it with bucket boom and load gravel. It's a dandy utility machine."

On a city paving job in Indianapolis a Barber-Greene Bucket Loader did the work of 16 shovelers, brought about an average daily pouring of 1500 square yards of 6-inch concrete base, with a maximum pour of 2200 square yards.

One of the notable features of a Barber-Greene's performance in Charlevoix, Michigan, is its ability to load loosened subgrade material day in and day out at the sustained average of 50 cubic yards an hour. Where the maximum yardage loaded in a day last year, without the loader, was 125 yards, the Barber-Greene increased this to 479 yds.

If you have not yet received copies of "Results on Road Jobs" and "Mechanical Snow Handling," send for them immediately. They will give you a surprising picture of the economies that this powerful, versatile machine is effecting, both winter and summer.

BARBER-GREENE COMPANY—*Representatives in Fifty Cities*—515 W. Park Avenue, Aurora, Illinois

BARBER B G GREENE

Portable Belt Conveyors Self Feeding Bucket Loaders

Coal Loaders . . . Automatic Ditch Diggers . . Coal Feeders

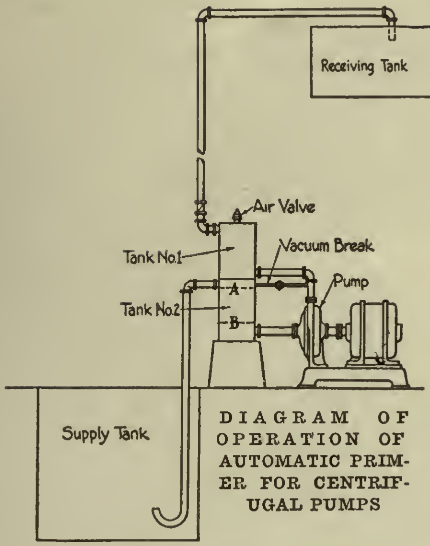


DIAGRAM OF OPERATION OF AUTOMATIC PRIMER FOR CENTRIFUGAL PUMPS

An Automatic Primer for Centrifugal Pumps

An automatic primer for centrifugal pumps consisting of a system of tanks and connections, which permits the use of a horizontal centrifugal pump on suction lifts without mechanical contrivances for producing a vacuum and without foot-valves, has been placed on the market by the Automatic Primer Company, 111 West Washington Street, Chicago, Ill.

This Apco primer consists of two tanks placed one above the other, arranged for connection to the pump. The tanks are proportioned to the size of the suction line and have sufficient capacity to store the air in the suction line when expanded to the vacuum of operation, with additional capacity to provide a safe working margin.

The accompanying illustration shows a typical installation. Tank No. 2 is filled with liquid to level "A." When the pump is started, it lowers the liquid to level "B" and in so doing produces a vacuum in tank No. 2. As the pump continues to remove the liquid from tank No. 2, the liquid is replaced by an equal quantity from the suction line. When pumping, tank No. 1 is filled with liquid. When the pump is stopped, the air valve at the top of tank No. 1 opens and allows the liquid in the tank to return by gravity through the pump to tank No. 2, forcing the air back to the suction, thus flushing the suction line and repriming the system. It is claimed there is no possibility of air binding the primer, as the water which enters from the suction line falls through the air which is trapped in tank No. 2 and entrains more than sufficient air to compensate for any air or vapor which might be released from the water when it is placed under vacuum. The vacuum break connection is made for the purpose of breaking the vacuum on the back flow when the pump is shut down. When the flow of water is reversed, there is siphoning action, which has to be broken or an air pocket might form in the pump, which would interfere with the starting operation. The vacuum break introduces air at the top of tank No. 2 just as soon as the opening in the discharge line is uncovered on the back flow. The introduction of air at this point allows the water in the suction line to fall and the original equilibrium is restored. When the pump is operating there is a slight leakage of water back through the vacuum break into tank No. 2, but it is usually much less than 1 per cent.

Air pockets in the discharge line are unlikely, as any air passed by the pump would accumulate in the top of tank No. 1, and escape through the air valve. This air valve is positive and will not pass liquid.

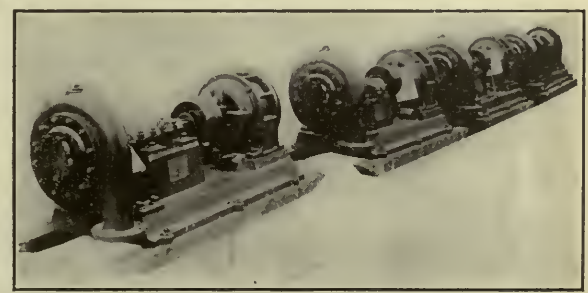
A Centrifugal Pump for Unscreened Sewage

A centrifugal pump suitable for handling water containing trash, such as particles of rags, roots, grass, papers and similar stringy material which is present in sewage and drainage water, industrial wastes, water handled by dredges, and, in fact, in almost all waters in more or less serious amount, unless the liquid is screened, has been designed by A. B. Wood and is sold by the Ellicott Machine Corporation, 1111 Bush Street, Baltimore, Md.

The entering edge of the Wood trash pump is rounded upon a considerable radius, which acts to bend and deflect the "stream" or "flow" lines in advance of the vanes, and this bending allows a long piece of trash to pass either on one or the other side of the vane before any portion of it is caught and plastered against the vane. The vane is reduced in cross-section towards the tail, which assures a free passage of any trash that has once cleared the entering edge. The vane is curved towards the tail, which resembles a fish tail, and this provides a powerful wedging or coughing action on any trash which may be reached or may have been caught by the entering side of the vane.

It is therefore next to impossible for any trash which can enter the suction of the pump to lodge on the runner, and the absence of any sudden eddies at the tail of the vanes as the water enters the casing makes available the full energy of this wedging action for the removal of the trash and the maintenance of continuing high efficiency.

The maximum efficiency of a 12-inch Wood trash pump, operating at 275 revolutions per minute, is 76 per cent, which is maintained quite uniformly from a delivery of 14 cubic feet per second to a delivery of 18 cubic feet per second. The efficiency curve is very flat between a delivery of 10 and 22 cubic feet per second. Efficiency of the pump is over 70 per cent on all heads between 16 and 31 feet.



FOUR 4-INCH WOOD PUMPS, PART OF TWO INSTALLATIONS TOTALING 16 PUMPS, FOR THE CITY OF HACKENSACK, N. J., FOR PUMPING SEWAGE

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Trinidad on "Main Street"

First in long life. First in low cost per year of service. That's why millions of square yards of Trinidad Lake Asphalt paving are in use today on the heaviest-travelled "Main Streets" of the world.

Trinidad pavements have other outstanding advantages. They are attractive, easy to clean, easy to repair and comparatively noiseless. That's why the "show" streets of the world—as well as the "Main Streets"—are Trinidad paved.

Trinidad Lake Asphalt is an ages-old bitumen—not an artificially produced compound. It is less affected under service conditions than any other bituminous paving material. Let us send you some interesting data.

THE BARBER ASPHALT COMPANY
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New York St. Louis Chicago Pittsburgh San Francisco Kansas City

TRINIDAD LAKE ASPHALT

JOINTING TWO SEWER PIPES BEFORE LAYING

Water-tight Joints in Tile Sewers

The infiltration of ground water into sewers must necessarily be guarded against in wet seasons, but in some places it is necessary at all times. If the joints are not water-tight, a large amount of ground water gets into the sewer, greatly overloading the disposal plant and reducing the capacity of the sewers for carrying the normal flow of sewage.

The penetration of fine roots of trees into the pipes through insecure joints is also a feature to be guarded against. Formerly cement joints were relied upon entirely for jointing sewers. About twelve years ago Ruberoid Pipe-Seal compound was placed on the market by the Ruberoid Company, 95 Madison Avenue, New York City. This compound is used in many municipal sewer operations, both by cities and contractors.

The base of Pipe-Seal is the same as P & B rapid asphalt paint, which has been used in underground work for more than 30 years. It is claimed to be positively inert in such locations. Some of the important characteristics claimed for this pipe seal are its absolute waterproof qualities, its resistance to sewage, acids and alkalies, its easy-working qualities, in that it melts at a temperature of 200° F. and pours in a thin liquid at 400° F. It congeals very quickly so that the forms may be removed within a few minutes, thus permitting work to progress rapidly, and it has a high burning point, so that it may be heated as high as 600° F., without injury.

In using this compound, pipes may be assembled in pairs, outside the trench, and the joints poured, and after they have hardened thoroughly the sections so made may be joined together in the trench with the aid of a joint runner or gasket, in the same manner that lead joints are generally poured.

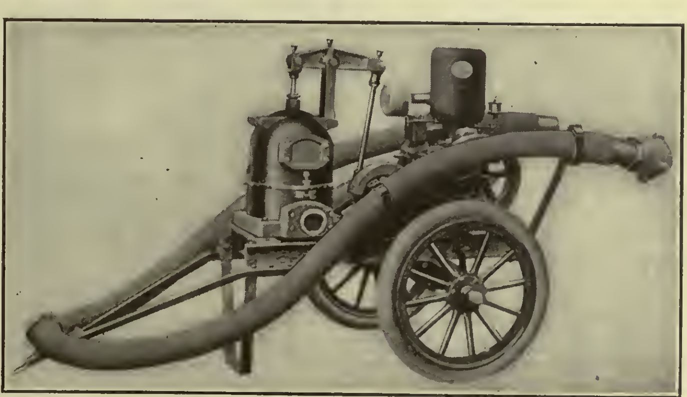
Allis-Chalmers Takes Over Worthington Plant at Cudahy, Wis.

The Worthington Pump and Machinery Corporation having decided to close its Power and Mining Works at Cudahy, Wis., and to discontinue its crushing cement, mining and creosoting machinery lines, the Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has taken over all the records, drawings, patterns, patents, jigs, fixtures and manufactured stock pertaining to these lines and will continue their manufacture at the West Allis Works.

A New Trailer-mounted Diaphragm Pumping Outfit

Single diaphragm pumping outfits, in both open-top and closed-top force types, made by the Novo Engine Company, Lansing, Mich., are now furnished mounted on two-wheel pneumatic-tired trailers. This mounting permits the outfit to be attached to an automobile or truck and moved from place to place rapidly. When thus attached, the prop under the front end of the outfit clears the ground, and the entire outfit is balanced, so that the pulling effort is very small. The wheel hubs are equipped with ball bearings to decrease the rolling friction. Brackets and straps are provided for carrying the hose, foot-valve and strainer.

This pumping outfit is especially adapted for use in cities where rush jobs are frequent, particularly in the repairing of water-mains or sewers. The entire outfit weighs about 960 pounds and has a capacity of 8,000 to 10,000 gallons of water per hour. The open-top type will lift water the usual 20 feet, but the water must flow away by gravity. The closed-top force-diaphragm type will lift water 20 feet and force it an additional 10 feet above the pump. Because of the closed pressure dome in the latter type, this pump is adapted to handle the contents of sewers, vaults and cesspools in a sanitary manner, as the liquid is kept enclosed from the source of supply to the point of discharge.



A NEW PUMPING UNIT FOR MUNICIPAL SERVICE

The Federal-Knight is the first light truck to incorporate the Willys-Knight power plant and with its advent into municipal transportation a new and long striven for dependability and economy is established. Federal chassis strength plus the quiet, responsive power and long life of the Willys-Knight engine makes a combination which is unequalled anywhere.

Price $1095—Detroit

Write for the Federal-Knight Folder

FEDERAL MOTOR TRUCK COMPANY
DETROIT, MICHIGAN

A New Device for the Treatment of Asphyxiation

A victim of gas asphyxiation or smoke suffocation is for the time deprived of the power to transport oxygen from the air through the lungs to the tissues of the body. Theoretically, oxygen inhalation is the obvious method for overcoming the asphyxia. Practically, however, the inhalation of oxygen alone does not fulfill its theoretical promise. An auxiliary agent is needed. The breathing of a normal man or animal, as is now well known, is largely regulated by the carbonic acid gas produced in the muscles and organs and carried by the blood to the respiratory center in the brain. Carbonic acid is the natural stimulus to this center and thus regulates normal breathing in the individual.

The supplying of enough carbonic gas mixed with oxygen has been found to serve as an immediate stimulus to spontaneous breathing by the patient, thus drawing oxygen in and washing the poisonous gas out of the tissues. Carbogen is the trade name of the correct mixture of oxygen and carbon dioxide.

The H-H Inhalator made by the Mine Safety Appliances Company, Chamber of Commerce Building, Pittsburgh, Pa., is a device for administering carbogen to the patient. When respiration has stopped, artificial respiration by the manual prone pressure method should be employed to start spontaneous breathing. This effort is assisted by administering Carbogen simultaneously from the Inhalator. Carbogen, by causing full ventilation of the lungs, rapidly eliminates poisonous gas from the blood, and this terminates the condition of asphyxia. The treatment is said to be highly effective, inducing rapid and complete recovery if applied early enough. It requires merely general medical supervision and may be carried out safely and efficiently by men of ordinary intelligence.

The Inhalator has a notable absence of attachments and adjustments; it is only necessary to turn the valves and apply the mask to the face of the patient. This machine is an excellent device for fire rescue companies, hospitals and other places where there is possible danger of asphyxia.

A COMPACT OUTFIT TO RESUSCITATE THOSE SUFFERING FROM ASPHYXIA

A STEEL DUMP-BODY FOR GARBAGE COLLECTION

A Steel Welded Garbage Dump Body

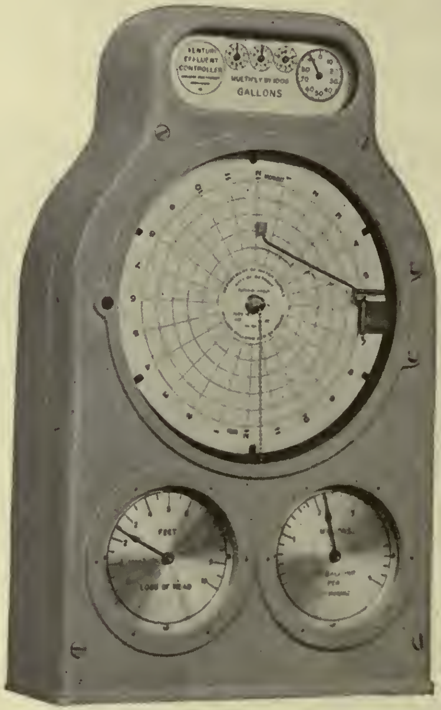
A water-tight garbage dump body made of No. 10 gage steel electrically welded throughout, is made by the Hughes-Keenan Company, Mansfield, Ohio. This garbage dump body is furnished with either vertical or under-body hoist and is made specially for mounting on a one-ton Ford chassis. The body measures 92 inches long at the top, 44 inches wide at the front, and 47 inches wide at the rear, and is 25½ inches deep at the sides. It has a capacity of 50 cubic feet when level full. The body equipped with a vertical hoist but without covers weighs 750 pounds net; with an under-body hoist and without covers 800 pounds net; and the covers alone weigh 140 pounds.

A New Small-Size Road Roller

A "Junior" roller of the three-wheel macadam type, made in 3-, 4-, and 5-ton sizes, has recently been placed on the market by the Galion Iron Works & Manufacturing Company, Galion, Ohio. The engineering features of this "Junior" roller are of interest. The power unit consists of a Fordson tractor from which the front truck and rear wheels have been removed. This power unit is carried on a full-length channel frame, which is shaped to receive the king post socket casting at the front end and extends to the rear of the unit so as to permit a scarifier to be properly attached.

In placing the power unit in the frame, the three-point suspension feature has been carried out, in order that the greatest possible flexibility may be secured without subjecting the power unit to any unusual strain. A full-length rear axle is provided which carries the weight through brackets attached to the main frame members in much the

Detroit's Great Filtration Plant is in Operation—



80 Filter Beds—Total Capacity 320,000,000 Gallons —the largest rapid sand filtration plant in the world.

80 Venturi Effluent Controllers control and indicate the Rate of Flow and Loss of Head, record the Loss of Head, and count the total Gallons, making the complete story of the operation of each filter bed continuously available.

The Filter Effluent Controller is the very heart of the filtration plant. Again and again the Venturi has been selected for the great filtration plants of the country.

16-page Bulletin No. 216 is ready.

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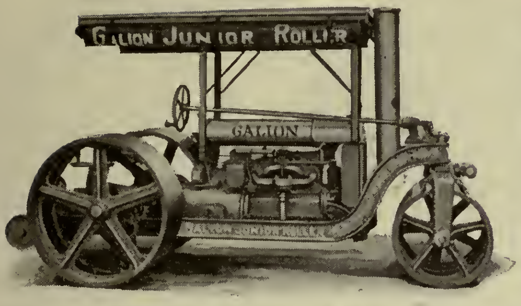
"Builders of the Venturi for 33 Years"



THE NEW GALION JUNIOR ROAD ROLLER

same manner as is employed in the construction of larger size macadam type rollers. A train of steel gears is provided which consists of a spur pinion placed on the main shaft of the Fordson unit, which connects with a spur gear on the bracket on the main drive, which in turn connects with the bull gear or main driving gear on the rear roll. This construction permits the use of all the speeds of the Fordson unit and increases the power 33⅓ per cent.

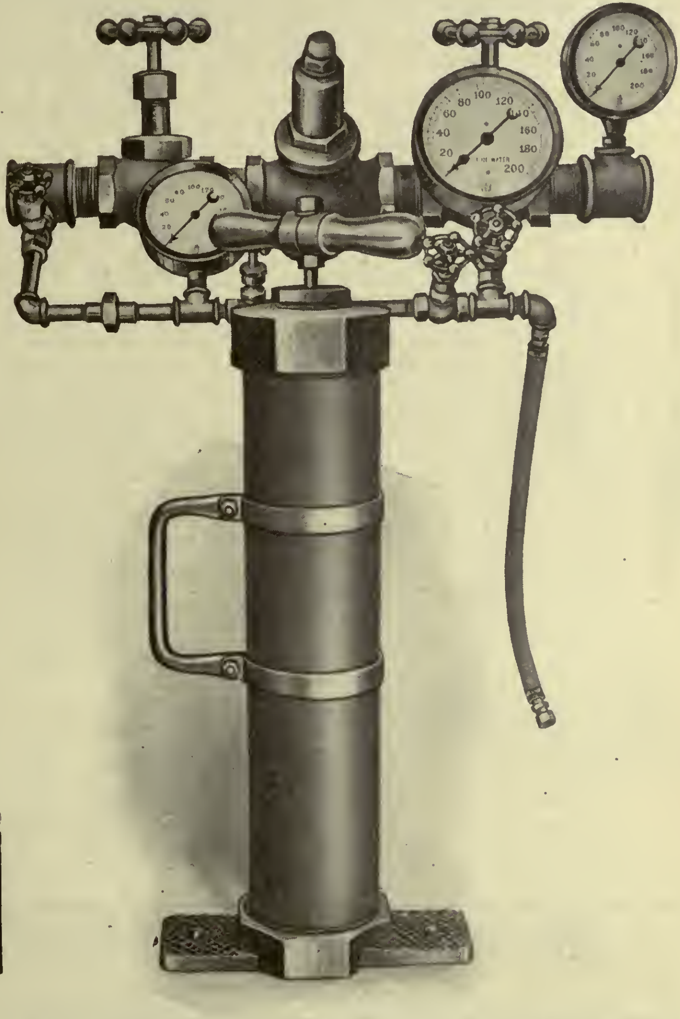
A planer to operate in front of the front roll is provided and is securely attached to the main frame members, being adjustable for light or heavy cuts. The angle of this planer blade can be changed to throw the material to either side as the character of the work may require.

A Hydraulic Water-Level Indicator for Air-Lift Pumping

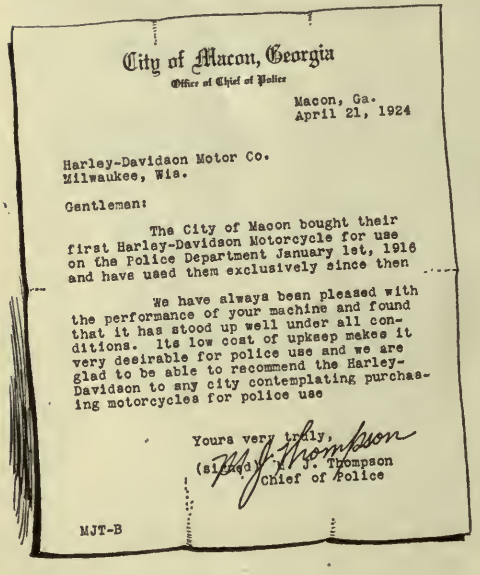
A slight fluctuation in the level of a well pumped by an air lift materially affects the efficiency of the outfit. Inasmuch as the water-level in most wells does not remain unchanged under all conditions there is a variation in the submergence of the water and air lines. The Hydraulic Engineering Corporation, 26 Cortlandt Street, New York City, has brought out a hydraulic water-level indicator which greatly increases the efficiency of pumping one or a group of wells by air lift by making regulation very easy.

One hydraulic testing device, as illustrated, will serve several wells; however, each well must be equipped with the copper tube, which should be a permanent fixture; the air to operate it can be compressed by the small pump, or, preferably, the air supply can be taken from the same source supplying the air pumping the well. The indicator shows the water-level, that is, the submergence, under any pressure and with any volume of air. It provides means for ascertaining the most favorable and economical conditions under which the water can be taken out of the well. It indicates the proper submergence and will make clear whether the water discharge and air lines are too large or too small, too long or too short. It shows how, and provides means, to bring into balance any number of wells yielding large or small quantities of water, so that all wells are balanced and no well is getting more air under greater or less pressure than it requires for economical operation.

The indicator, which is complete with all gages, pressure-reducing valves, etc., and can be put in operation on any well pumped by air, is not intricate in its workings, and no computing is necessary. Equipment of this type is being purchased by consulting engineers as well as city water departments to more readily check up the efficiency of air-lift wells.



A MACHINE WHICH HELPS MAINTAIN THE EFFICIENCY OF AIR-LIFT WELLS



City of Macon, Georgia
Office of Chief of Police

Macon, Ga.
April 21, 1924

Harley-Davidson Motor Co.
Milwaukee, Wis.

Gentlemen:

The City of Macon bought their first Harley-Davidson Motorcycle for use on the Police Department January 1st, 1916 and have used them exclusively since then

We have always been pleased with the performance of your machine and found that it has stood up well under all conditions. Its low cost of upkeep makes it very desirable for police use and we are glad to be able to recommend the Harley-Davidson to any city contemplating purchasing motorcycles for police use

Yours very truly,
M J Thompson
(signed) M. J. Thompson
Chief of Police

MJT-B

Let us send you free catalog showing new models in actual colors. Lightweight alloy pistons; Alemite lubrication; full-floating sidecars; handsome olive green finish, maroon striped.

EXCLUSIVE

in Macon Since 1916

MACON, Georgia, has one of the best Police Departments in the South. Crooks stay away or, if they do drop in, soon move out. Motorists are careful about speeding—fewer accidents. Drunken and reckless drivers are scarce.

A typical Harley-Davidson-policed city! Since January, 1916, Macon police have used Harley-Davidsons *exclusively*.

Macon is just one of more than 1600 cities and towns that rely on this famous motorcycle for police protection. One Harley-Davidson-mounted officer covers more territory than *several* unmounted men—a big saving! And when something happens, a motorcycle officer is on the scene "in time to do his work."

Learn how one or more Harley-Davidsons can help *your* city. Write for special literature.

Harley-Davidson Motor Co.
Dept. M Milwaukee, Wis.

Harley-Davidson
The Motorcycle

CONCRETE SWIMMING POOL AT CRETE, NEBR., IN WHICH ELASTITE EXPANSION JOINTS AND PREFORMED MEMBRANE WATERPROOFING WERE USED

Waterproofing Concrete Swimming Pools and Reservoirs

In a concrete swimming pool or reservoir, it is necessary to provide for the retention of large quantities of water, not only to prevent possible losses, but to prevent a property damage to surrounding structures. In waterproofing such a structure there are two methods which can be considered—the integral and the membrane systems. It is claimed that the membrane system, if properly selected, will insure permanent results, even though small defects develop in the concrete to which it has been attached, while the integral system fails if the concrete fails.

The Carey preformed membrane system of waterproofing made by the Philip Carey Company, 9 Wayne Avenue, Lockland, Cincinnati, Ohio, consists of two layers of asphalt-saturated felt with a heavy body of asphalt plastic interposed, all combined to a uniform thickness under careful mechanical control. It is made in standard sheets 3 x 5 feet in ¼- and ½-inch thicknesses, and is furnished complete with all materials necessary for installation.

Since the asphalt rather than the felt is the real waterproofing barrier, this system does not rely upon a thin "mopping" of asphalt, but provides a thick, heavy uniform layer of asphalt plastic which will conform to any irregularities of the structure. It is claimed that this system is particularly efficient because it minimizes the amount of labor required for its application, resulting in a speedier, smoother, heavier and more uniform application of the desired water-proof barrier. The economy of the application results principally from the fact that the building up to the desired thickness is accomplished by a mechanical process in the factory instead of on the job.

The view above shows the swimming pool at Crete, Nebr., in which this system of insuring concrete work has been used.

De Laval Opens Pacific Coast Offices

The De Laval Steam Turbine Company, Trenton, N. J., has announced the formation of a Pacific Coast sales organization covering California, Oregon and Washington, and parts of the adjoining states, under the direction of William Pullen, with offices at Los Angeles, San Francisco and Seattle. The Los Angeles district office, 312 Union Oil Building, 617 West 7th Street, is in charge of Ivan E. Goodner. The San Francisco district office, 531 Rialto Building, Mission and New Montgomery Streets, is in charge of Mr. Pullen, assisted by Eck Baughn and Charles P. Markley. The Northwestern district office at Seattle, Wash., is located at 1306-7 L. C. Smith Building, and is in charge of James Q. Osborne, assisted by F. A. Hurlbut.

Kincaid Elected Vice-President of Garford

The Garford Motor Truck Company, Lima, Ohio, has elected Russell M. Kincaid Vice-President of the company. Mr. Kincaid's connection with the company in the capacity of assistant to the President dates only from March 1, but the results of his work since that time have warranted his election, according to John L. Galvin, Chairman of the Board of Directors. Emmet R. Curtin is President of the Garford Company.

Ditcher Company Moves to Dayton

The Chas. T. Topping Machinery Company, formerly of Pittsburgh, Pa., has announced the removal of its headquarters to Dayton, Ohio. The post office address is Box 842, Dayton, Ohio. The offices of the company will be located at the plant of the Smith Gas Engineering Company, Moraine City, a suburb of Dayton, Ohio, where the Topping Pony Ditcher, a light-weight traction trench excavator, powered by a Fordson tractor, is manufactured on a standardized production basis.

Cutting Corners!

No. 69 Maintenance.

You can't cut the corners on maintenance expenses by using inefficient or inadequate equipment.

The one and sure way to meet rising costs of road repairs is through the use of time and labor saving equipment.

Littleford Equipment is that kind.

Catalogue on request

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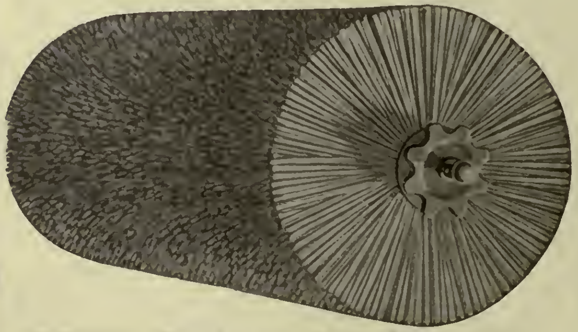
500 East Pearl Street **Cincinnati, Ohio**

Littleford Tar and Asphalt Heaters are reasonable in first cost, give long, dependable service, and require fewest repairs and replacements. Made in all types and capacities.

SERVICE --- ECONOMY



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Vol. XXXI
No. 2

The American City Magazine

AUGUST
1924

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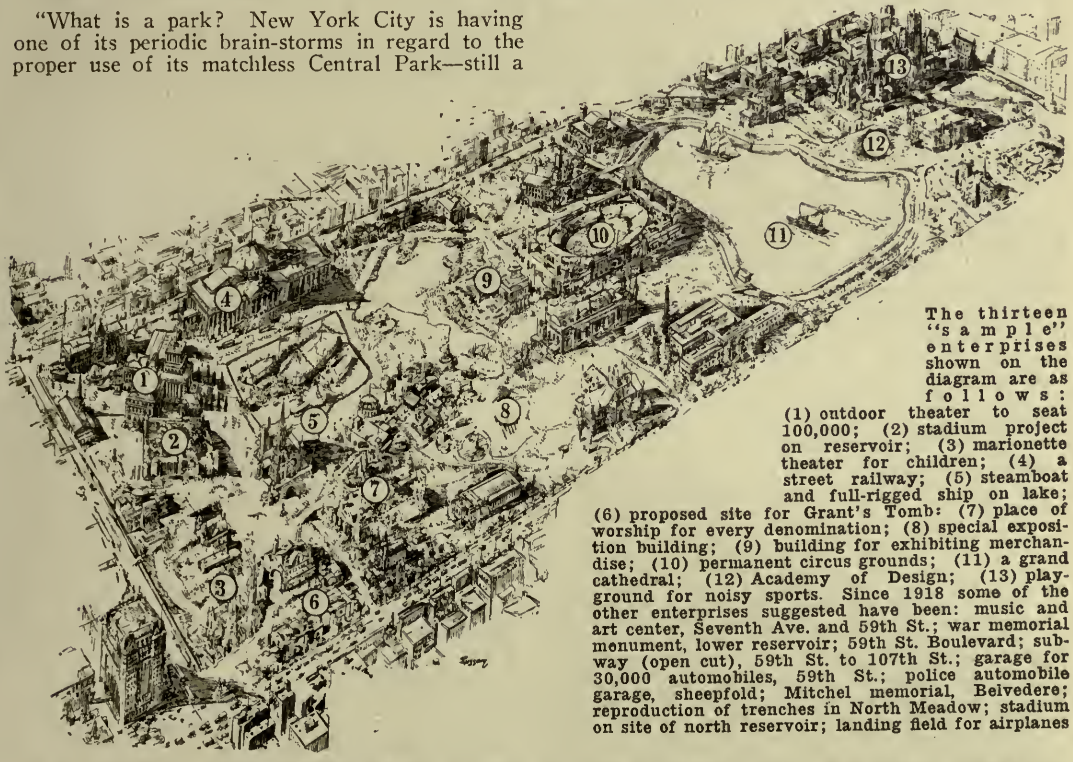
Saving the Parks for Their Proper Purposes

WHEN *The Nation* and *The New York Times* take the same stand on a civic question, the ordinary citizen in need of guidance may quite safely follow their lead. A case in point is the opposition of these two journals and of many other newspapers and civic organizations to the oft-renewed agitation for putting Central Park in New York to uses for which it was never intended. Said *The Nation* in a recent issue:

"What is a park? New York City is having one of its periodic brain-storms in regard to the proper use of its matchless Central Park—still a bit of unsubdued nature in the midst of man-ridden Manhattan Island. The Mayor and his friends are for introducing a 'civic center,' a 'war memorial,' and the like; others are for keeping them out. Similar controversies are going on in other cities. Perhaps it would help to begin by defining a park.

"A child once defined salt as something that makes food taste bad when you leave it out. Similarly one might define a park as something that a city isn't. It should be the antithesis of and the antidote for the city. Geographically it



The thirteen "sample" enterprises shown on the diagram are as follows: (1) outdoor theater to seat 100,000; (2) stadium project on reservoir; (3) marionette theater for children; (4) a street railway; (5) steamboat and full-rigged ship on lake; (6) proposed site for Grant's Tomb: (7) place of worship for every denomination; (8) special exposition building; (9) building for exhibiting merchandise; (10) permanent circus grounds; (11) a grand cathedral; (12) Academy of Design; (13) playground for noisy sports. Since 1918 some of the other enterprises suggested have been: music and art center, Seventh Ave. and 59th St.; war memorial monument, lower reservoir; 59th St. Boulevard; subway (open cut), 59th St. to 107th St.; garage for 30,000 automobiles, 59th St.; police automobile garage, sheepfold; Mitchel memorial, Belvedere; reproduction of trenches in North Meadow; stadium on site of north reservoir; landing field for airplanes

HOW CENTRAL PARK MIGHT HAVE LOOKED IF THE INVADERS HAD NOT BEEN DEFEATED

A few of the unsuccessful attempts to divert the park from its primary purpose, as visualized by "The New York Times" should be as close to, and in character as far from, the city as possible. The best park is that which gives one most quickly and completely the illusion of having left the city miles away. Granting this, one can put his finger at once on some things which as far as possible should be kept out of a park: noise, hurry, buildings, business, and amusements such as the city itself offers. On the positive side one wants quiet, repose, trees, grass, water, sunshine, air. Too much artifice is the ruin of many parks: too many formal 'drives,' too many statues, too many 'lawns' with warnings to keep off the grass. The Parisians, with their fine sense for such things, are especially successful with their small parks. There are not many walks and often not much grass. Instead there are great trees, with fine sand spread over the ground; one may wander at will or sit where he pleases.

"Children, lovers, and the aged—it is these that use most and most appreciate our parks. None of them belongs precisely to the city. Each one is living in his way a life apart from that of the throngs about him—the throngs preoccupied with making and spending money, mesmerized with the loud speaking (human and mechanical) of the age. Children, lovers, and the aged—all of us should belong, at least in spirit, to one of these classes. If we make and keep our parks for them we shall not go far wrong."

In addition to its editorial opposition to encroachments in Central Park, *The New York Times* has helped its readers, by the illustration here reproduced, to visualize what these well-intentioned invasions might ultimately mean. Among the letters published by the *Times* was one by Frederick W. Kelsey, known as "The Father of the Essex County, New Jersey, Parks," in which Mr. Kelsey said in part:

"The whole situation is another exemplification of the practical fact that half the trouble in the world grows out of misunderstandings. That the City Administration is favorably disposed to the parks and park extensions throughout Greater New York is obvious from what has been accomplished by official proceedings in acquiring and improving additional park areas during the past few years. It is equally obvious that of those in authority, and the few good citizens who as publicists formerly favored the art museum encroachment, hardly one, if any, of them has ever given the subject of park location, construction and development especial study, or has had practical experience in this matter that has now become a vital and most important factor in municipal growth everywhere."

President's Conference Advocates Ten Per Cent of Community Area as Minimum for Recreation

THE following paragraphs are from the resolutions adopted by the National Conference on Outdoor Recreation, held in Washington May 22-24 at the call of President Coolidge, and attended by some 300 delegates from more than 120 organizations interested in the great out-of-doors.

"In view of the massing of our population in cities and towns, which, so far as foreseeable, will increasingly continue; and in view of the helplessness of children and youths to determine their own environment, and admitting their inherent right to a place in which to play, the Conference recognizes that it is the duty of every community to provide and operate, either by public or private means, adequate space for play and recreation and that at least ten per cent of the area of a community should be regarded as the minimum requirement for this purpose, so distributed as to give all sections, as nearly as may be, equal accommodation as to location and area.

"And to this end in new city additions of ten acres or more this provision should be made a condition of such additions' acceptance by the municipalities.

"And recognizing further that recreation, aside from its pleasure-giving object, is an important element in fostering good citizenship, it is the duty of the community to furnish on its playgrounds organized recreation under executive leadership of high character.

"The growth of our cities and communities has been such that inadequate provision has been made for the recreational needs of their people, and land within the corporation limits of such communities is costly. Very definite cooperation should be sought with cities, towns and rural communities looking toward the acquisition by gift, or purchase by public funds, of tracts of land generally unsuited for cultivation, but well adapted for outdoor recreation, within reasonable distance from the centers of said cities, towns or communities, with the object of developing such areas as may be selected for general recreational centers open to all citizens and their families under regulations to be determined by said cities and communities."

Eleventh National Recreation Congress to Meet in October

THE Eleventh National Recreation Congress is called by the Playground and Recreation Association of America at the height of the nation's appreciation of the value of recreation. Individuals, groups and communities are realizing now as never before how vital a force for health, happiness, morality and education is the right sort of play. Nearly 700 American cities maintain directed play centers, and over 12,000 men and women are employed as recreation directors.

This year's Recreation Congress convenes in Atlantic City, October 16 to 21.

The eighteen years' progress of the public recreation movement will be reviewed. "What constitutes an adequate recreation life for children and for adults of different ages?" will be among the questions answered. The subjects to be discussed include physical efficiency, family recreation, camping, real estate and playgrounds, objectives in community recreation and the community art movement.

FROGS IN THE PAGEANT, "WEDDING OF THE FAIRIES"

Pageantry in the Parks

By Karl B. Raymond

Director of Recreation, Minneapolis Board of Park Commissioners

PAGEANTRY has found a decided place in park playground activities. The pageant offers an avenue of expression for large groups of children. The pageant for children catches and holds the interest of both young and old. It is one of the greatest factors in developing community spirit. Parents, teachers and other interested adults lend their services to making a success of the performance, the children acting as an intermediary between the playground directors and their parents and guardians.

For seven years an annual pageant has been presented by children of the Minneapolis park playgrounds. This outdoor spectacle attracts about 50,000 people each year. It is presented two evenings near Lake Harriet, at the Rose Gardens, which are located in a natural amphitheater, where extensive seating capacity is offered.

Arts and crafts learned by children in their playground classes find practical application in pageantry. Dancing and song dominate the entire production. Knowledge of designing, art work, and sewing is used by the youthful actors in making their costumes. The pageant in Minneapolis commenced with a cast of about 500, and last season 1,500 children participated. Productions staged in the past seven years by the recreation department of the Park Board include "Mother Goose," "The Pied Piper of Hamlin," "The Magic Wand," "Weaver of Dreams," "Wedding of the Fairies," and "Lost in Toyland." This year, "Once Upon a Time" is the title of the play being written and planned by Mrs. Alice Dietz, director of recreation for women and girls, which is to be given as the closing event of the playground season on August 14.

Planning a Pageant

Six divisions are outlined by Mrs. Dietz in planning a pageant: First, write the theme, being careful to choose a story that is familiar to children. Children cannot stage historical pageants successfully. They are too young to have understanding of the events portrayed. Another element in opposition to the historical spectacle is the inability to awaken interest in the adult population, who are no longer in school and are unfamiliar with the subject featured. Fairy tales are ideal because of their outdoor settings. Interiors should be avoided. Use of canvas should be extremely limited, as it gives an artificial effect to an outdoor scene.

The second step consists in designing the costumes, which should be as colorful as possible. Spectacular effects should be the aim of the costume designer. Colors should be chosen that will harmonize in mass groups, making a pleasing ensemble. When outstanding costumes are ready, appointments are made with press photographers, who take photographs to be used in the newspapers as publicity features for two weeks previous to the entertainment.

The selection of music is important. Records chosen for the training classes should be limited to those for which band arrangements are obtainable. Dances must be planned and written to suit the music. Electric and scenic effects are the next step. Arrangement of the program comes last.

"Brevity is the soul of wit" in children's pageants. They should be kept within the one-hour limit. Never for any reason should they exceed an hour and a half. The children must be returned home at an early hour.

Use as few adults as possible, and avoid extensive solo work. The best effects are obtained in large groups.

Financial budgeting is a factor. The producer must remain within his allowance. An exact estimate must be made of costs for costume material, notions, scenery, foot, spot and flood lights, records, band arrangements, printing, engraving, loose equipment and general labor. Crêpe paper of good quality has been found to be the cheapest and most practicable for costumes. It can be sewed on the machine like cloth. It stands out and holds the color against the rays of the sun. At a distance it gives the same effect as fabric.

When assigning parts, our director calls her staff of teachers together and teaches them the dance steps, and they in turn instruct the various groups. Each playground is responsible for certain numbers. Each instructor receives samples of costumes. She calls together the older girls of her field, mothers of the neighborhood, members of Parent-Teacher groups and other organizations, who assist her in making the frocks.

In selecting a setting for the pageant, a place should be obtained where ample seating capacity may be provided, as a children's program is a big community attraction in which a great many homes are represented by their little folk.

DOLLS FROM PARIS IN THE PAGEANT, "LOST IN TOYLAND"

Surface Treatment and Maintenance of Roads with Coal Tar

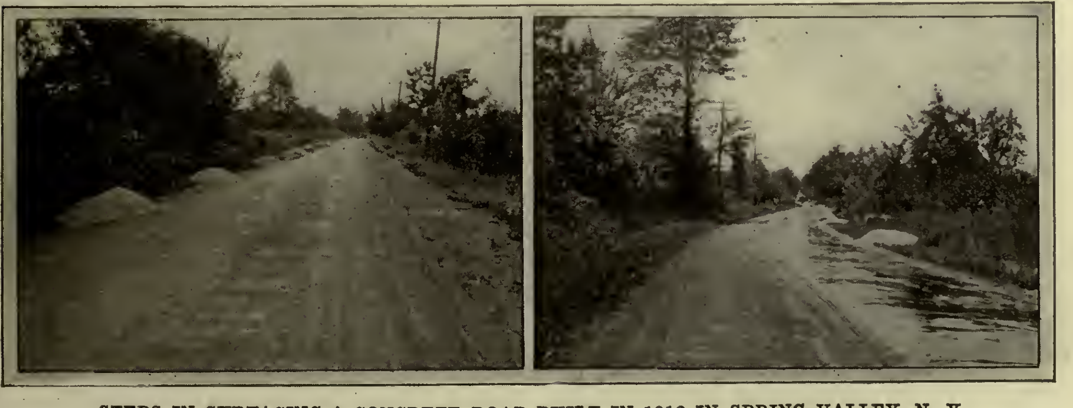
By J. S. Crandell

WE should draw a line between repair and maintenance. The latter cannot be undertaken until the former has been completed. No one would think of painting an old house without first going over the building and making it ready for the paint. Yet how often we find road men, who should know better, trying to surface-treat an old, worn-out road that is full of pot-holes, ruts, and soft spots, and covered with dirt. When the treatment goes to pieces, it is the material that is blamed instead of the workmanship.

Pot-holes present a somewhat mean repair problem, because to properly patch them takes time and experience. It is so easy to throw a shovelful of cold patch mix in the hole and trust to luck that traffic will iron out a nice, smooth road, that the average patrolman or gang does the repairing this way. A pot-hole is really more difficult to repair well than a rut is. More care is taken with the rut, because it is bigger and does not occur so frequently. A rut that is patched usually rides well, anyway, while a poorly repaired hole is always a bump.

A patch ought to be made of material identical with that making up the body of the road. Sometimes this is not possible, as stone, brick, or other material may have been brought in from a distance, and none has been kept for repairs. I have seen holes and ruts in water-bound gravel roads patched with granite chips and cold patch bitumen. I have seen bituminous-bound macadam patched with sand and calcium chloride. I have seen wood block pavements patched with anything handy—from sheet asphalt to granite blocks. And so on indefinitely. If the patch is harder than the body of the road, then the road wears away and leaves the patch sticking up; while, if the patch is softer, then a depression begins.

One reason why patches are not always satisfactory is that the same material is not always used for the binder. There is a vast difference between the many bituminous cold patch materials on the market, and this difference must be kept in mind. We do not expect the day laborer to be aware, but the engineers most certainly should watch it. For instance, the emulsions require about 27 gallons per cubic yard of stone, and if sand is added, some of them require as much as 54 gallons. The asphalt cutbacks require about 21 to 27 gallons per cubic yard of stone and sand. The tar cutbacks, on the contrary, require not more than 18 gallons for corresponding aggregate, which amount must be cut down to 14 gallons in hot summer weather. Now, just consider what happens when you put a gang to work mixing up Tarvia-KP and aggregate when they have been used to either asphalt emulsion or asphalt cutback. Not realizing the difference in materials, they proceed to make up a big batch of mix, and find that it is far too rich. Probably some of the tar will drain off if a pile of mix is allowed to stand for a week or so, but even then there will be an excess of tar, and when the patch is made it



STEPS IN SURFACING A CONCRETE ROAD BUILT IN 1912 IN SPRING VALLEY, N. Y.
At left, concrete road swept and ready for bituminous surface treatment. At right, half the concrete road treated with bituminous material at rate of ½-gallon to the square yard

COMPLETING THE SURFACING OF A CONCRETE ROAD

At left, rolling the limestone cover in the Tarvia A surface treatment of the concrete road. At right, Mount Ivy Road, Spring Valley, N. Y., after resurfacing with one application of hot bituminous material and Tompkins Cove limestone chips

never hardens sufficiently, and so you get a rolling, waving patch that deserves all the rough things said about it.

As a rule, 16 gallons of tar cold patch is right. But this must be thoroughly mixed with the aggregate. For very clean stone, with no sand present, this is too much tar, while for soft limestone or slag it is better to use 18 gallons. Be sure to take this into consideration. Not only does an excess of tar make for a faulty patch, but it is also wasteful and uneconomical.

A satisfactory patch should be dense, free from voids, and water-proof. To effect this, some care is necessary in selecting the aggregate. Experience has demonstrated that the harder stones, such as trap rock and granite, do not produce enough fine material of themselves to make a closed mix, and that the addition of clean sand is necessary to completely fill the voids. The softer stones, such as limestone and dolomite and slag, crush to some extent during the operations of mixing, laying and rolling. Small-sized particles are produced which take the place of sand and do away with the necessity for using it. Where the stone is very soft, better results are obtained if the sand is omitted entirely. The following rule is satisfactory: With hard stones use one part sand and three parts stone. With soft stones use no sand.

Many patches go to pieces when bad weather comes, because they are not dense enough to keep the water out. The cure is to seal-coat the patch. There is a vast difference of opinion as to when it should be done. Many say to seal-coat as soon as the patch is rolled, or before the final rolling, covering with sand or chips to prevent picking up by traffic. Others say, wait awhile and seal-coat when the patch is a week or two old. Others say, do not seal-coat at all, but roll well and let traffic compress the patch until it is dense enough to be water-proof. Perhaps the safest rule is to seal-coat patches made with hard stone almost immediately, and soft stone patches in about two weeks, except that if the road is to be surface-treated soon, there is no need for a seal coat, as the treatment will supply it.

Cold patching is popular, but hot patching has many advocates. Hot penetration patches are quite satisfactory and have one distinct advantage over any cold patch, and that is that the patch sets up hard as soon as the tar cools.

The Surface Must Be Clean

Now, if the road is repaired, we may surface-treat it, and thus maintain it against weather and traffic. But first we must see to it that the surface is thoroughly clean. Time and time again I have been sent to investigate instances of failure, only to find that it was the dirt on the road that was the cause of the trouble. Manure is the chief offender. Sometimes it adheres so firmly to the road that a steel broom has no effect on it. This is particularly true on limestone roads where the stone has a high cementing value and is soft. The manure mats on the surface, and the limestone dust seems to form a cement with it that defies anything but a shovel or pick. It is absolutely necessary to remove every trace of manure and other filth before attempting a surface treatment.

Almost any type of improved road or pavement will take a surface treatment, although some of the gravels are not satisfactory. In the case of a gravel road that never has been treated, it is wisest to try out a few hundred feet as an experiment. If the treatment does not appear to be satisfactory, a modification may be necessary, or perhaps the gravel is not suitable. Where there are pockets of clay or sand, pot-holes will develop, or the clay is usually unsuited for treatment. By harrowing in some clean gravel and thoroughly mixing it with that containing the excess clay, it is possible to produce a road that will take a surface treatment.

Macadam, tar macadam, asphalt macadam, bituminous concrete, cement concrete, brick, wood block, and granite block may all be successfully maintained with surface treatments of tar, but the treatments must be modified to suit the different types of pavement.

A surface treatment is more than just the sprinkling of a bituminous material over a road surface. It consists of the thorough cleansing of that surface before the material is applied, and its subsequent covering. The cover is almost as important as the application, in some cases, and should never be selected and used haphazardly. Many an otherwise good job is spoiled by the wrong kind of cover.

This brings us to the consideration of the best method of spreading the cover. I am assuming that the tar is applied by a modern pressure sprayer, and that that much of the work is done. Now it seems strange that chip spreaders have not been used to the same extent as other road-building apparatus. Chip spreaders are a great advance on hand spreading. I cannot see how it is that so many still spread by hand. It is wasteful and costly in the extreme. In the first place there are always piles of stone placed along the sides of the road, and these waste about 10 to 15 per cent of the stone, because this much is either lost or becomes so mixed up with dirt that it must be rejected.

There is no loss of cover when spread by machine. Any unevenness or inequality may be adjusted by putting on a man with a push broom, who brooms out any windrows or pockets of cover that may be formed. The time has come when we must forget muscle and use machinery. It takes 50 men as much time to spread a surface treatment of tar by hand as it does two men with a pressure distributor, and the same is true of other operations.

ACKNOWLEDGMENT.—From a paper read before the New Jersey State Highway Association.

Municipal Central Stations in the United States Now Total 2,125

FOLLOWING is the *Electrical World's* segregation of the private and municipal central stations in the United States, its colonial possessions and Canada as of January 1, 1924, as indicated by the 1924 McGraw Central Station Directory:

CENTRAL-STATION COMPANIES AND MUNICIPAL PLANTS IN THE UNITED STATES, ITS POSSESSIONS AND CANADA, AS OF JAN. 1, 1924

State or Possession	Total Central Stations	Central-Station Companies	Municipal
Alabama	65	30	35
Alaska	12	11	1
Arizona	32	28	4
Arkansas	85	62	23
California	79	58	21
Colorado	72	45	27
Connecticut	43	40	3
Delaware	15	6	9
District of Columbia	3	3	0
Florida	89	42	47
Georgia	156	47	109
Hawaii	8	8	0
Idaho	48	32	16
Illinois	271	178	93
Indiana	202	120	82
Iowa	223	122	101
Kansas	252	77	175
Kentucky	113	89	24
Louisiana	75	33	42
Maine	79	74	5
Maryland	46	35	11
Massachusetts	122	81	41
Michigan	187	102	85
Minnesota	216	94	122
Mississippi	94	42	52
Missouri	217	151	66
Montana	53	48	5
Nebraska	254	97	157
Nevada	15	13	2
New Hampshire	51	47	4
New Jersey	56	43	13
New Mexico	27	22	5
New York	296	236	60
North Carolina	148	84	64
North Dakota	140	100	40
Ohio	276	164	112
Oklahoma	138	57	81
Oregon	56	43	13
Pennsylvania	233	187	46
Philippine Islands	5	5	0
Porto Rico	7	5	2
Rhode Island	12	10	2
South Carolina	81	48	33
South Dakota	115	65	50
Tennessee	100	69	31
Texas	308	271	37
Utah	42	22	20
Vermont	56	46	10
Virginia	95	72	23
Washington	81	66	15
West Virginia	74	68	6
Wisconsin	262	171	91
Wyoming	41	32	9
U. S. Total	5,826	3,701	2,125
Canada	548	220	328
Grand total	6,374	3,921	2,453

The Mechanical Equipment for a Sewage Screening Station

A Description of the Cut-off and Screen Chamber of the 25th Street Storm-Water Sewer of the Borough of Queens, New York City

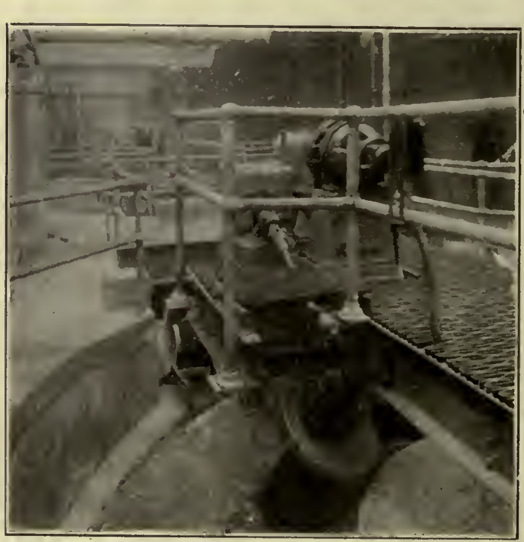
TWO of the important items of the contract for the construction of the sanitary and storm-water sewer in 25th Street, Borough of Queens, New York City, are the cut-off chamber and screen chamber, with their respective mechanical equipment. The cut-off chamber is built of reinforced concrete and is approximately 218 feet long. There are 16 units of adjustable weir gates installed in this chamber for controlling and separating the sanitary sewage and storm-water flow. These weir gates are of special and unique design, each gate consisting of three leaves or stages, and each leaf is controlled independently and positively through worm-gear mechanism.

The gates are known as multiple-leaf twin type weir gates. The control mechanism shaft passes through the center and controls the complete unit. This installation may be set to permit the overflow of sewage at the first, second or third stage and may be changed or regulated by operating the control mechanism through a manhole from the street. Each half of the twin gate is 4 feet, 4¾ inches long by 3 feet high and is made of accurately machined and fitted cast iron. The mechanism for controlling the opening or closing of each leaf consists of spur gears, worm and worm-gear segments, with their separate spindles for controlling each of the three leaves.

The sewage after leaving the cut-off chamber runs by gravity through the sewer to the screen chamber, a distance of approximately 1,000 feet. The screen chamber is located on the water-front. The entrance of the sewage to the screening plant is controlled by a hydraulically operated sluice-gate. The sewage then passes to a bar screen and onto two 14-feet-diameter disc screens set at a slope of 20 degrees. The screens are equipped with manganese bronze plates, machine cut, with twin slots 3/64-inch wide, and screen brush cylinders of wood.

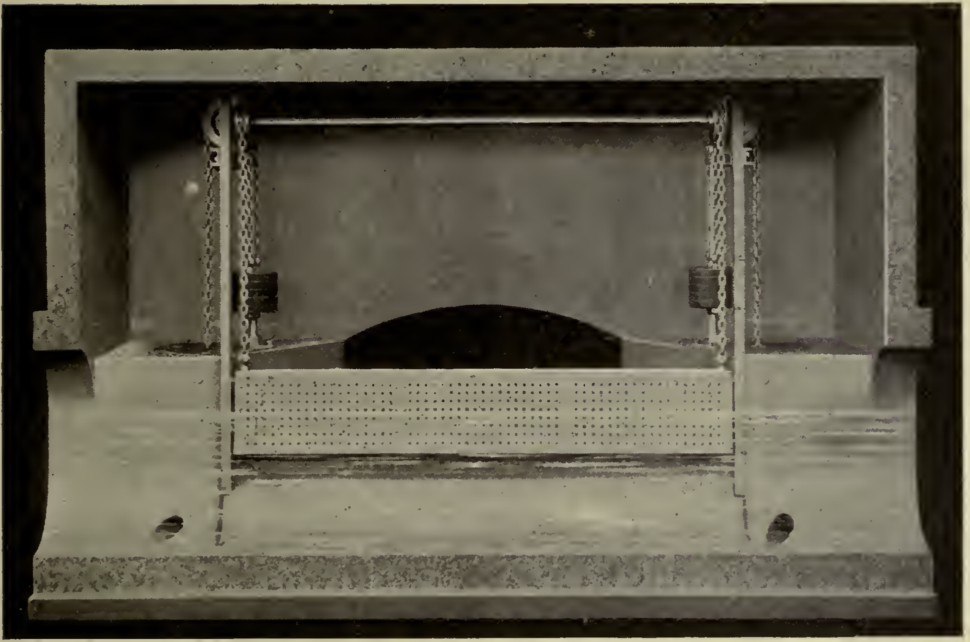
The screen chamber is equipped with a pump and accumulator for furnishing pressure to the sluice-gates, turntable and cans for screening. The chamber also has an I-beam trolley and hoist, a switchboard, electric lighting and plumbing.

Another important item in the contract for the sanitary and storm-water sewer in 25th Street is the floating trash screen, which is located between the weir chamber and the outfall at the junction of a 3-foot, 9-inch sewer which parallels the shore and the storm sewer.



14-FOOT DIAMETER DISC SCREEN FOR SEWAGE TREATMENT PLANT, BOROUGH OF QUEENS, NEW YORK CITY

MULTIPLE-LEAF WEIR-GATES IN THE 25TH STREET SEWER, BOROUGH OF QUEENS, NEW YORK CITY



FLOATING TRASH SCREEN FOR 25TH STREET SEWER, BOROUGH OF QUEENS, NEW YORK CITY

The object of this screen is to prevent trash from coming from the 3-foot 9-inch sewer during the storms. The screen is arranged to adjust itself to the flow by means of floats, as shown in the illustration. During dry weather the sewage flows through the floating screen chamber into the sewage treatment plant. All of the weir chamber and screen chamber mechanical equipment was furnished and installed by The Sanitation Corporation.

Municipal Plant Again Cuts Rate

By W. F. Schaphorst

THE municipally owned electric light and power station, heating plant, water and telephone systems of Brookings, S. Dak., have already been illustrated and discussed in THE AMERICAN CITY, in the July, 1922, issue, on pages 69-73. The latest news from that enterprising little city states that on May 1 its citizens began paying still lower electric light and power rates than have been in force since the new plant was installed; in fact, they expect to outdo any other city in the state of South Dakota as a result of the passing of an ordinance by the City Commissioners. The electric light rate has been reduced to 10 cents per kilowatt-hour and the power rate to 6 cents per kilowatt-hour.

The new water-tube boilers and power-generating outfit that were installed and described have been entirely satisfactory and have given far greater economy than the old plant gave; in fact, before the installation of the new equipment the rate was 15 cents per kilowatt-hour. In this short time—less than two years—the new plant has yielded an income sufficient to meet all interest and depreciation charges besides giving the city a comfortable profit.

The new ordinance provides for a charge of 10 cents per kilowatt for the first 50 kilowatts and 9 cents for each kilowatt in excess of that. The minimum charge for each residence per month is 50 cents. The power rate is 30 cents per month for each connected horse-power and 6 cents per kilowatt-hour. The rate for electric stoves and ranges is fixed at 6 cents per kilowatt.

Beginning September 1, the steam heating rates will be lowered. The old rate has been $1 per 1,000 pounds of condensate. The new charge is 90 cents per 1,000 pounds of condensation for the first 10,000 pounds, and 80 cents per each additional 1,000 pounds.

Hours and Wages for Street-Cleaning Employees

Abstracts of Reports from Street-Cleaning Officials in Various Cities

IN Chicago, Ill., according to W. J. Galligan of the Bureau of Streets, non-uniformed street cleaners receive $4.90 a day, and uniformed cleaners $5.00 a day. They are allowed 10 cents per day for the purchase of two uniforms and keeping them clean. They work 8 hours a day and 6 full days a week.

In Minneapolis, Minn., according to F. D. Furlong, Street Commissioner, street cleaners receive $5.00 per day for an 8-hour day.

A. B. Cook, Chief, Sanitary Department, Charlotte, N. C., reports that in Charlotte street sweepers are paid 50 cents an hour, and truck-drivers 45 cents an hour. No vacations with pay are given.

M. H. Zink, Superintendent of Public Service, Highland Park, Mich., reports that they pay 70 cents an hour for sweepers and 90 cents for truck-drivers. Even at these wages it is difficult for the municipality to get men, as they have to compete with the Ford plant, where the men can average $8.00 a day. The city is paying 70 cents, 90 cents, $1.00 and $1.10 for common labor; 90 cents for truck-drivers; $1.00 for all street sweeper men; and $1.10 and $1.25 for crane and shovel operators.

T. C. Bothwick, Commissioner of Streets and Public Improvements, Joliet, Ill., reports that street sweepers receive $3.60 a day. They use dump-carts, and the cart men receive $4.31 a day for 8 hours' work. The men are not uniformed. Truck-drivers on 1-ton trucks receive $4.31 per day. About 52 per cent of the streets are paved.

Theodore Eichhorn, Superintendent, Department of Streets and Public Improvements, Erie, Pa., reports that regular laborers receive 45 cents an hour, and truck-drivers 50 cents an hour. There are no uniformed men, and no vacations with pay are allowed. The men work 8, 9 or 10 hours a day, according to the appropriation or amount of money that is in the various funds at the different seasons of the year.

E. G. Millner, Sanitary Engineer, Long Beach, Calif., reports that Long Beach pays $5.00 a day for men and furnishes the uniforms and keeps them clean; even if fresh ones are required every day, the city sends them out to a private laundry. The cost of cleaning is about 30 cents a suit. There are about 110 miles of pavements in Long Beach and there are about 45 more miles to be added this year. The pavements are cleaned by means of white wings, supplemented by a flusher. The flusher is not successful, in that the streets lack drainage, having no sewers or catch-basins. A beginning, however, is being made in this line. There are 25 men cleaning streets. The dirt is swept into piles, and a pick-up wagon collects the piles each day. In the business district, the streets are swept every day, and in the residence district once a week.

P. J. Hurtgen, Director of Public Works, Kenosha, Wis., reports that Kenosha has only four regularly employed street-cleaning laborers, dressed in ordinary citizen's clothes. They are paid 45 cents an hour for 8 hours, and when unusual conditions arise—as for instance, a carnival or something of that kind—if they get behind in their work, they are put on for 10 hours a day. The ordinary working day is 10 hours, with Saturday afternoons off. In order to have the down-town district clean for Sunday, the street cleaners get out early Sunday morning. At the beginning of the season they had about 28 miles of pavement, which was covered with these four hand sweepers, and a motor pick-up sweeper and pick-up laborers. The operator of the sweeper is paid 65 cents an hour, and the pick-up men 50 cents an hour. The operator of the truck that picks up the sweeping receives 60 cents an hour, although he is not classed as a chauffeur. A broom pusher receives 45 cents, pick-up men 50 cents, and all truck men 60 cents.

George A. Gregory, Street Commissioner, Racine, Wis., reports that white wings in Racine are paid $3.75 for a 9-hour day, and that there are regular men who receive $4.19 for a 9-hour day. The latter perform any kind of services required, such as loading wagons, cleaning streets, etc. There are two men who do repairing, one getting $4.67, and the other $4.83 per day. They have a sprinkler, a catch-basin cleaner, two small Ford dump-trucks, and two machine sweepers. The chauffeurs on these receive $5.50 for a 9-hour day.

Hal W. Smith, Commissioner of Streets,

Evanston, Ill., reports that labor, including street sweepers working 8 hours per day, receives $5.20; drivers of small trucks, $5.60; drivers of large trucks, $6.00; and the driver of the street sweeper, $6.80.

F. D. Furlong, Street Commissioner, Minneapolis, Minn., reports that laborers working on street cleaning are paid as follows: scrapers, $5.00 a day; truck drivers, $6.00; caterpillar operators, $7.20; and the foreman in charge of the equipment, $8.00 per day. The city has no uniformed men. The operator of the roller receives $7.00 a day, and the operator of the pick-up sweeper $5.00 for 8 hours, and an additional dollar for time beyond the 8 hours, making $6.00. None of the day men are given vacations with pay, but the yearly men get two weeks' vacation with pay.

Edward F. Murphy, Sanitary Division Engineer, Boston, Mass., reports that in Boston ordinary labor is paid $4.00 a day or $30.00 a week, which means 44 hours. The men receive two weeks' vacation with pay. They are not uniformed.

Clinton H. Fisk, Director of Streets and Sewers, St. Louis, Mo., reports that street laborers are paid 52½ cents an hour, working 8 hours. If they report on a rainy morning, they are allowed a half-day's pay. They are not required to come back in the afternoon unless it clears up. The operators on the machine are paid a monthly rate of $125.00. These are the only two rates of pay in the Street Cleaning Division. The day men receive no vacation with pay. The truck men and the monthly men are allowed two weeks with pay. They are also allowed two weeks' leave of absence with full pay; two weeks at half-pay, and two weeks at one-quarter pay. If the absence is over six weeks, it is on their own time.

Goline Doremus, Engineer of Street Cleaning, Newark, N. J., reports that Newark pays its street cleaners a flat rate of 45½ cents an hour. They are uniformed and pay for their own uniforms. The truck, sweeper and flusher drivers are paid $30.00, $34.61, and $36.00 per week, depending upon their length of service. They are allowed six whole days a year with pay, and a week's vacation with pay.

Mat Miser, Superintendent of Streets and Sewers, Huntington, W. Va., reports that they pay 45 and 50 cents an hour for street cleaners; 50 cents is the maximum. The men work 10 hours a day, except on Saturdays, when they work half a day with a full day's pay. They receive no vacation with pay.

W. F. Martin, Superintendent of Street Cleaning, Richmond, Va., reports that the laborers are paid 40 cents per hour; drivers of 1-ton trucks, 44 cents; drivers of street sweepers, 52 cents; drivers of flushers, 52 cents; and mechanics, 62 cents. All laborers get 5½ holidays with pay, and 10 days' vacation with pay.

Alfred J. Paul, Superintendent of Public Works, Ann Arbor, Mich., reports that street sweepers receive 45 cents an hour for a 9-hour day. They have one Elgin sweeper, the operator of which receives 70 cents an hour for a 9-hour day. The truck drivers and tractor drivers are paid 65 cents an hour. The men get no vacations with pay.

ACKNOWLEDGMENT.—From the Proceedings of the Fourth Annual Conference of the International Association of Street Sanitation Officials, in 1923.

Street Cleaning in South Bend, Ind.

THE Street Department of South Bend, Ind., has general charge of sweeping and cleaning paved streets and alleys, as well as the maintenance of all streets and alleys, sewers and bridges, and the repair of all excavations made in pavements by contractors, public corporations and the city water-works, supervision and maintenance of the city's 5- and 10-ton steam rollers, miscellaneous hauling for all departments of the city, such as ashes and rubbish from fire stations, City Hall and other public buildings, and also the collection and disposal of garbage, small dead animals and night-soil.

The street-cleaning equipment of this department consists of one 1,500-gallon capacity motor flusher and two Elgin motor-driven pick-up sweepers. The motor flusher works two shifts every night in the down-town district and every day in a different territory in the residential section. The motor sweepers cover the entire city once each week. The department has asked for another motor sweeper, in order that the city may be covered more frequently.

The department is urgently seeking the cooperation of merchants in keeping the business district clean by sweeping off their sidewalks and not putting the dirt and refuse in the gutter, except between certain hours. The street flusher and cartmen commence their work on the business streets at midnight, and by 7 o'clock in the morning the down-town business district has been cleaned. Then the merchants open their stores, and sweep dirt and refuse from their sidewalks into the clean streets, and on account of automobile parking the streets must remain dirty all dav. The street-cleaning efficiency will be noticeably increased by the new ordinance prohibiting all-night parking.

An Analysis of Garbage Disposal

By Samuel A. Greeley
Consulting Sanitary Engineer, Chicago, Ill.

GARBAGE disposal is a phase of sanitary engineering perhaps less closely related to the public health and in which less progress may perhaps be recorded than in the fields of water-supply and sewage treatment. Refuse disposal as a science was little known fifty years ago. In this country, it was first started on the way to a scientific basis by Rudolph Hering in 1887. One of the first garbage incinerators in America was built for the United States Government on Governor's Island in New York Harbor in 1885. The Merz system of garbage reduction for the manufacture of grease and fertilizer was introduced into America at Buffalo in 1886.

Since the installation of these two plants, many different methods of incineration and reduction have been developed. Some of them have been successful and others unsuccessful, depending, in my judgment, in considerable measure upon the rationality of the design from an engineering standpoint and the soundness with which the works were built, plus the ever important aspect of efficient operation.

Many years, however, before the introduction of these special processes, garbage was buried in the soil or fed to hogs. Even now, these methods are satisfactory, although they are frequently abused in spite of their long use.

In order to make this discussion of the present status of garbage disposal more concrete, I am outlining briefly an investigation which we are just now making into the garbage and refuse problem of New Trier Township, immediately adjacent to the city of Chicago on the north. This discussion is based on a study of communities with populations under 100,000.

In the discussion the term "house refuse" means garbage, ashes and rubbish. Refuse is a comprehensive term including mixtures of its various classes. Garbage, although relatively small in quantity, is the most readily decomposed and therefore most likely to create nuisance as well as to harbor flies, rats and vermin. Ashes are by far the largest in quantity, but are relatively inert. Rubbish, comprising old papers, boxes, barrels and the like, is the most bulky and unsightly.

Statement of Methods

The following describes the available methods of garbage disposal:

(a) Garbage can be disposed of by shallow burial. Modifications of this are: plowing into the soil; land fill with the addition of relatively clean, inert materials; and dumping into large bodies of water.

(b) The food value of fresh garbage is sufficiently great to have made feeding to hogs an old and very common method of final disposal. During the war the use of this method was greatly extended.

(c) European practice has largely developed to the burning of refuse in specially designed furnaces with or without an additional fuel. This is a sanitary but relatively expensive method.

(d) The reduction method of garbage disposal consists in causing the garbage to be separated into four parts—water, grease, tankage, and volatile matter. This method is more applicable to larger than to smaller cities.

(e) A recent method introduced from Italy is the so-called Beccari system, in which the garbage is allowed to ferment in specially designed masonry chambers for a period of several months, at the end of which time it has a fertilizer value.

There are, of course, other special methods, and under the general term, methods for collection should also be included, as, for instance, by horse-drawn vehicles, by motor trucks, or by the tractor-trailer system.

New Trier Township Survey

New Trier Township in Illinois includes four incorporated towns with a present population of about 26,000. The township comprises almost entirely residential districts and extends some six miles along Lake Michigan on the east and inland three to four miles. The bulk of the population lies in the area within a mile and a half of Lake Michigan, but rapid growth is pushing the population to the west. An old marsh a mile or so wide extends along the entire western margin. This is gradually being drained or filled and made habitable.

At the present time the collection and disposal of garbage and other refuse is done on a more or less informal basis. The collection is partly by contract and partly by hired trucks under village operation. The garbage is taken to the west and either plowed into the soil or fed to hogs. This has been inexpensive, but has given trouble through uncertainty as to operation and the creation of nuisance.

Ashes have been dumped along new roads and in available low areas. This has been quite satisfactory, but the space is limited and will be exhausted in about two years. It is estimated that the production of ashes amounts to about 20,000 tons per year, or 34,000 cubic yards, which would cover 4 acres 5 feet deep.

Garbage, on the other hand, amounts to about 4,000 tons per year, or 8,000 cubic yards. The production is quite low in winter and very high in summer. This amount of garbage, at the rate of 40 pounds to yield one pound of pork, would produce 200,000 pounds of pork per year.

Rubbish has been dumped, much to the displeasure of the local improvement associations. It has disfigured parts of otherwise attractive districts.

The cost of collecting and disposing of this house refuse amounts to about $78,000 per year, or about $3 per capita of the total population. If every house in the township were given service, the cost would probably increase to upwards of $4 per capita.

The contracts for garbage disposal have been let from year to year, and the places of disposal have had to shift with the encroaching population. This uncertainty, coupled with the anticipated shortage of dumps, led to the present investigation. At the present time I am not at liberty to report any specific conclusions, but a number of relative conclusions may be of interest.

Conclusions from Survey

For garbage disposal, incineration, burial, hog feeding, and the Beccari process were considered. The costs per ton for disposal at a single plant, two plants, and three plants were computed, including in each case the estimated cost for hauling or transportation. The single plant proved to be the least costly, with two plants more favorable than three. The reason for this was apparently because the motor permits of relatively long hauls on good roads at high speeds with little difference in the cost as between a single plant and three plants. As between the various methods of garbage disposal for a single plant, the following computations showed the different net cost per ton: incineration, $3.10; burial, $1.94; hog feeding, 76 cents profit; Beccari process, 35 cents.

Obviously, incineration is quite expensive. Hog feeding may not be permissible in the district under consideration, although the estimates included all practical methods for eliminating nuisance. Burial in conjunction with ash disposal in the swampy area along the west margin of the district offers possibilities, particularly if the value of reclaimed land should be included.

In this community are many lawns, gardens, country clubs, and the like; therefore, it is possible that the fertilizer produced in the Beccari process will have a steady market. This process, consequently, has an interesting application in this particular community.

In the disposal of ashes, the cost of haul is relatively more important. The cost of disposal by dumping was estimated at 48 cents per ton. A worth-while consideration for ash disposal would be the purchasing of waste land and reclaiming it by fill, thus securing a return by the increased value. This, of course, would have to be done under careful management and accounting.

For rubbish, it seems essential to make some disposition that will not disfigure the community. The least expensive is dumping. Under proper operation the readily salable portions of the rubbish would be picked out. The bulky, easily combustible portions would be burned in a brick pit. Tins would be baled. The residual rubbish and baled tins would be dumped and buried with the ashes. A more expensive rubbish disposal would be complete sorting in a building for shipment out of the district, with high temperature incineration of the residual.

Collection

As regards collection, it is believed that for this district motorized equipment would be best because it is cleaner on the streets than collection by horse-drawn vehicles. Careful studies of the best size and kind of equipment for the proposed service are being made. Present indications show a close decision as between light, inexpensive types of trucks and heavy, more or less expensive trucks of large capacity.

It remains now to relate the somewhat general studies to available sites and local operations so that a workable scheme can be perfected. It is quite likely that the disposal will be planned for a progressive development. The various combinations and alternatives which require consideration in working out a refuse disposal project are apparent from this description. There are four principal elements to deal with and three to be satisfied, including householders, the public, and economy of operation. Between these four elements, namely, house treatment, collection, haul, and final disposal, and the three elements to be satisfied there appear to be nineteen different relationships. Thus, collection is influenced not only by the house treatment and haul, but also by items of cost in operation, public considerations, methods of final disposal and the like.

ACKNOWLEDGMENT.—From a paper read at the Third Annual Conference of Health Officers and Public Health Nurses, Lansing, Mich.

Stopping Water Leaks in Dayton, Ohio

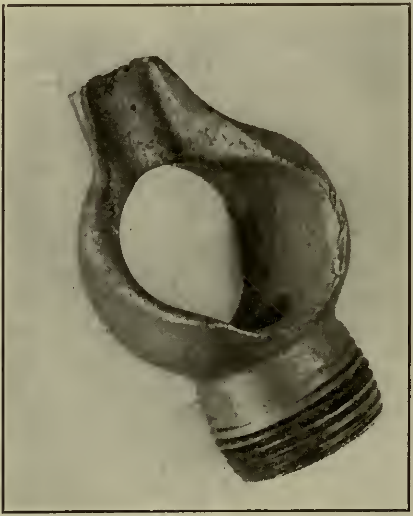
Pitometer Survey Has Resulted in a Saving of About 3,250,000 Gallons per Day

A LEAK WHICH WASTED 80,000 GALLONS OF WATER A DAY IN DAYTON

CITIES all over the country are taking steps to conserve their water-supply, as the dry summer east of the Mississippi in 1923 showed many weak spots. The pitometer survey which has been conducted on the distribution system of the Division of Water, Dayton, Ohio, by the Pitometer Company, has resulted in the finding of approximately 400 leaks, which have been repaired, causing a saving of about 3,250,000 gallons per day.

The leak illustrated was discovered by the water-waste survey on McLain Street during March, 1924. Approximately 80,000 gallons of water were lost through this leak and flowed into the sewer each day. The savings which have been effected in stopping these leaks have not only taken care of the increased consumption due to the expansion of the distribution system, but have also resulted in a decrease in the average daily pumpage of approximately 8 per cent, as compared to the pumpage of one year ago. The water-waste survey started June 6, 1923, and has just recently been completed.

The picture of the corporation cock shows the manner in which it had been worn away by the grit under the action of the water from the main.



CORPORATION COCK WORN AWAY BY WATER LEAKING FROM MAIN

The Design and Construction of Asphalt Pavements

By Prevost Hubbard

Chemical Engineer, The Asphalt Association

ASPHALT pavements are pavements in which the wearing course consists of mineral fragments bound together with asphalt cement. A few attempts have been made to substitute other materials for the mineral aggregate, but the total yardage of such pavements laid in the past is so small that they may be disregarded.

Wearing Course and Black Base Defined

The term "wearing course" in this article will be restricted to a course of asphalt-bound mineral fragments not less than one inch thick, in order to distinguish between asphalt pavements proper and roads or pavements which have been merely surface-treated with asphalt or road oils of an asphaltic nature. The asphalt wearing course, which is seldom constructed less than 1½ inches and frequently 2 or 2½ inches thick, may be laid directly on any type of foundation or on an intermediate course 1 to 2 inches thick, of an asphaltic type, which in certain designs is termed the binder course.

In designs where the foundation itself is constructed with an asphalt-bound mineral aggregate of any desired thickness, the term "black base" or asphalt base pavement is used to describe the structure. The asphalt base may be placed directly upon the proposed subgrade or upon a subbase course of gravel or broken stone. In any event, the asphalt base is laid to a greater thickness than the usual binder course, seldom less than 3 inches and sometimes as thick as 6 inches.

Constituents of Asphalt Pavements

Mineral Aggregate.—In all asphalt paving combinations, whether wearing course, binder or base, the mineral aggregate is the predominating constituent and forms the body of the structure. Its characteristics, including physical properties and grading, have fully as much effect upon the serviceability of the pavement as have the characteristics of the asphalt cement with which it is combined. A wide range of mineral products may, however, be successfully used in asphalt construction if care is exercised in the selection of a suitable type of pavement for the mineral aggregate which it is desired to use for any individual case. It is therefore of rare occurrence that local mineral aggregate cannot be used in the construction of some type of asphalt pavement. Thus gravel, broken stone, broken slag, sandstone dust and even clay can all be utilized if properly selected and used.

When the mineral aggregate consists of relatively large angular fragments, a certain stability of the paving structure, which is not possible with an aggregate consisting of fine mineral particles, may be secured by the keying together or interlocking of these fragments under compression even when the large voids are not packed with other material. This fact makes practicable the construction of the simplest type of asphalt pavement, known as the asphalt macadam, in which the asphalt is applied after the mineral aggregate has been laid. If the large fragments are rounded, as in the case of most gravels, a thorough packing of the large voids is necessary to secure stability, and as it is practically impossible to pack such voids after applying the asphalt, and impossible to coat the fragments with asphalt after the voids have been packed, a mixed type of construction must be used. All fine mineral aggregate composed of particles of less than one inch diameter must also for obvious reasons be mixed with asphalt prior to being placed in the pavement structure.

The bulk of all mineral aggregates used in the construction of wearing courses should be reasonably resistant to wear and should be composed of hard, durable fragments which will not fracture under traffic. Paving mixtures must be proportioned so as to contain sufficient asphalt to coat and bind together all particles of the mineral aggregate, but cannot carry a sufficient excess of asphalt to adequately cover a much greater surface area of mineral particles than that originally present, without producing a mushy, unstable mixture. For this reason, if the mineral fragments in the wearing course of a mixed asphalt pavement tend to fracture under traffic, raveling and disintegration of the wearing course takes place. Toughness or resistance to fracture is, of course, not as important a consideration where the mineral aggregate is protected from the direct action of traffic by being placed below the wearing course, as in the construction of an asphaltic concrete base. If for any reason it is necessary to use a rock of relatively low toughness in an asphalt wearing course, the asphalt macadam is probably the safest type to adopt, for the reason that stability is secured principally by an interlocking of the mineral fragments and because of the method of construction, and more asphalt is present near the surface than is absolutely needed to bind the fragments together. Occasional fractures are therefore cared for by this excess of asphalt.

Relatively high resistance to abrasion of the mineral particles of the wearing course is of course desirable for any type of pavement, but in asphalt pavements constructed with a seal coat fairly soft rock may be successfully used, particularly if it is of a calcareous nature. It is well known that a mixture of asphalt with pulverized limestone makes an exceedingly tough mastic, and such a mastic is slowly produced on the surface of an asphalt pavement constructed with limestone, provided sufficient asphalt is present to combine with the dust produced by abrasion of the coarse fragments.

Asphalt.—The principal function of asphalt in an asphalt pavement is to bind together the mineral fragments which constitute the body of the road structure. Asphalt paving cements are plastic by nature and when used as a coating or binding medium for mineral aggregates produce a structure which is to a considerable extent flexible. This fact sharply differentiates asphalt pavements from those constructed with hydraulic cements which produce rigid structures, and has a most important bearing upon the selection of cross-sectional designs and any comparison of such cross-sections with those of a rigid nature.

The properties which an asphalt should possess in order to function properly in a pavement structure are generally understood, and specifications for paving asphalt have been pretty well standardized. Because there are a number of different types of asphalt pavement using mineral aggregates of different degrees of natural stability, and because the consistency of an asphalt cement varies with its temperatures, thus producing a variable degree of flexibility in the pavement structure, a single grade of asphalt cement cannot be used for all types of asphalt pavements. This has led to the establishment of a number of well-defined grades, as determined by the hardness of the product measured in terms of the penetration test. During 1923 nine standard grades of asphalt for asphalt pavement construction were unanimously adopted by a conference of consumers and producers called by the United States Department of Commerce, and these grades are now being generally adopted throughout the country.

The success of an asphalt pavement depends not only upon the characteristics of the mineral aggregate and the asphalt cement, but upon the proportions in which they are combined. The allowable variation in proportion of asphalt cement which should be used with any mineral aggregate is very limited as compared with hydraulic cements, and it is quite as serious a mistake to use too much asphalt as too little in the construction of the pavement. As a matter of fact, determination of the correct amount is just as important as, if not more important than, the selection of the best grade or consistency of asphalt to use. The use of too little or too hard an asphalt in general reduces the flexibility of the pavement, which then at low temperatures acquires certain of the characteristics of the rigid pavement. On the other hand, the use of too much or too soft an asphalt may increase the flexibility of the pavement to such an extent as to make it readily plastic and subject to displacement under traffic. Fortunately, however, experience and careful observation over a period of more than forty years have resulted in a standardization of practice which if conscientiously followed insures highly satisfactory results.

Types of Asphalt Pavements

There are four well-defined types of asphalt pavements, each having certain characteristics which favor its selection in preference to the others for certain combinations of local conditions. In many cases, however, selection between at least two types is more a matter of preference based upon previous local experience or relative first cost than upon any other considerations. These four principal types are (1) asphalt macadam, (2) asphaltic concrete, (3) sheet asphalt, and (4) asphalt block.

Asphalt Macadam.—The asphalt macadam wearing course is usually constructed from 2½ to 3½ inches thick, depending to a considerable extent upon the quality of the mineral aggregate which is available for use. This ordinarily consists of broken stone, although mine tailings or crushed slag also make satisfactory products if properly selected. It is necessary that the fragments be angular and, except for sealing the surface, that they be of fairly uniform size. Crushed gravel may be substituted for broken quarry stone, provided that it is produced by crushing only that portion of the gravel which fails to pass a 3½-inch screen. For rock which has a per cent of wear of not more than 7, it is customary to use for the body of the wearing course fragments which pass a 2½-inch screen and are retained on a 1¼-inch screen, in which case the finished wearing course is made approximately 2½ inches thick. If a softer rock only is available, it is desirable to increase the average size of the fragments to material which passes a 3- or 3½-inch screen, in which case the thickness of the wearing course is correspondingly increased.

The coarse broken stone is spread over the prepared foundations and rolled until the fragments interlock, after which melted asphalt cement of 85 to 100, 100 to 120, or 120 to 150 penetration, depending upon traffic and climatic conditions, is applied uniformly over the surface at a rate of 1½ to 2 gallons per square yard, according to the thickness of the wearing course. Surface voids are then filled by rolling in a smaller broken stone product, which is lightly broadcasted over the surface, after which a seal coat of hot asphalt is applied at the rate of approximately ½-gallon per square yard and covered with stone chips, which are rolled in until thoroughly bonded.

Without discussing reasons which in most cases are obvious, it may be stated that the following details are of vital importance in the construction and maintenance of a high-class asphalt macadam pavement. The slighting of any of these details is apt to materially shorten the useful life of the pavement, although the bad effects may not begin to be seen until some time after construction is completed:

1. The individual fragments of coarse mineral aggregate should be clean and free from dust, so that the hot asphalt cement will readily adhere to their surfaces.
2. Before the first application of asphalt is made, the fragments of mineral aggregate should be well keyed together by rolling, otherwise an uneven surface will develop under traffic, due to shifting about. Rolling should not, however, be carried to the point of abrading the fragments so as to produce a coating of stone dust on their surfaces.
3. Before application of the asphalt, the course of broken stone should show a uniform distribution of voids. Pockets of fine material which prevent uniform penetration of the asphalt should be removed and replaced with mineral aggregate of suitable size.
4. Asphalt should be applied only when the broken stone course is dry for its entire depth and when the weather is sufficiently warm to prevent chilling the asphalt at the surface to such an extent as to prevent proper penetration.
5. Great care should be taken to distribute the asphalt at a uniform rate per square yard both during the first application and in the construction of the seal coat.
6. After the seal coat asphalt has been applied, only sufficient stone chips should be rolled in to take up the excess asphalt. Overloading the seal coat with mineral matter materially shortens its life.
7. The seal coat of the asphalt macadam should be carefully maintained, and before it has completely worn away the surface should be treated again with an application of asphalt and stone chips. Such re-treatment will greatly prolong the life of the underlying wearing course.

Asphaltic Concrete.—Asphaltic concrete wearing courses are usually constructed 2 inches thick. They are composed of a mixture of asphalt cement with broken stone, mine tailings, broken slag or gravel and usually with sand and mineral filler as well. The mixture is ordinarily prepared at an asphalt plant from preheated mineral aggregate and asphalt, and while hot is laid and compressed upon the prepared foundation. Certain patented or proprietary asphaltic concrete mixtures are, however, prepared or laid without preheating the constituents. There are two main classes of asphaltic concrete, known as coarse graded aggregate and fine graded aggregate. In the former the proportion of mineral particles larger than ¼-inch diameter is greater than any other constituent of the mix, the fine aggregate which consists of sand and mineral filler serving principally as void-filling material between the larger mineral fragments. In the fine graded aggregate asphaltic concrete, on the other hand, sand or fine mineral particles which will pass a 10-mesh sieve predominate and the larger fragments are merely suspended in the matrix of fine aggregate without being in immediate contact with one another.

In preparing coarse graded asphaltic concrete it is customary to screen the hot aggregate into two sizes, coarse and fine, and to recombine them in the proportion of about 2½ to 1 by weight. Mineral filler most of which will pass the 200-mesh sieve is then added to the extent of about 5 per cent of the total mix. From 5 to 8 per cent of asphalt cement is required to coat and bind the aggregate into a dense homogeneous mass. After spreading, raking and rolling, this mixture develops a surface of rather open texture which requires a seal coat. Such a seal coat may be constructed with a surface treatment of asphalt followed by an application of stone chips applied in much the same manner as described for the asphalt macadam. The coarse aggregate for this class of pavement is usually required to pass a 1¼-inch screen and be retained on a ¼-inch screen. It should be composed of sound, durable particles which will not fracture under traffic, but because of its relatively large size and the fact that voids are well packed with fine aggregate the particles need not be angular. Opportunity is therefore offered for the utilization of a good grade of local gravel. This, together with the fact that the sand or fine aggregate need not meet as rigid grading requirements as for other classes of asphalt paving mixtures, creates an advantage which in certain instances may be a deciding factor in the selection of type.

Fine graded asphaltic concrete is so similar in character to the wearing course of a sheet asphalt pavement as to have acquired the term "stone-filled sheet asphalt." The great bulk of the mixture consists of carefully graded fine mineral aggregate meeting all the requirements for sheet asphalt, but may consist partly of stone screenings as well as sand. The mixture usually carries from 20 to 35 per cent of coarse aggregate which will pass a ⅝- or ½-inch screen and be retained upon a 10-mesh sieve, from 7 to 11 per cent of mineral filler passing a 200-mesh sieve, and from 7.5 to 9.5 per cent of asphalt. The coarse aggregate should preferably be of hard, durable broken stone or slag which produces a rather rough texture surface, but not one which requires a seal coat. The use of gravel pebbles for coarse aggregate should be avoided, as they are apt to be picked out of the surface of the pavement by traffic and have small holes which serve as a starting point for progressive surface disintegration. This class of asphaltic concrete has become quite popular in certain sections, particularly where coarse aggregate is more expensive than fine aggregate, and offers many of the advantages of sheet asphalt, usually at a lower cost.

Sheet Asphalt.—Sheet asphalt pavements are those in which the wearing course is composed of a mechanical mixture of asphalt cement with a carefully graded sand and mineral filler. This mixture is often called sheet asphalt topping or surface mixture and is usually laid on an intermediate course of asphaltic concrete known as the binder course. The total thickness of binder and wearing courses is generally 2½ or 3 inches, with a minimum thickness of 1 inch for either course; 1½-inch binder and 1½-inch wearing course is probably the most common design adopted for the sheet asphalt pavement. The binder mixture is similar to the usual coarse aggregate asphaltic concrete, except that it carries a smaller percentage of sand and no mineral filler, as it is not necessary to completely fill the voids and it is desirable to obtain a surface texture after compaction which will permit a close bond with the wearing course. Sheet asphalt is designed to withstand severe traffic conditions. Particular attention should be paid to securing a sand for the wearing course composed of hard, durable grains free from clay, loam and other foreign material and meeting the well-standardized mesh composition or grading limitations which experience has shown to be desirable and which are embodied in most sheet asphalt specifications. The topping mixture is composed of from 70 to 80 per cent of sand, from 10 to 20 per cent of mineral filler passing the 200-mesh sieve, and from 9.5 to 12.0 per cent of asphalt.

In both fine aggregate asphaltic concrete and sheet asphalt paving mixtures mineral filler plays a very important rôle. It serves not only to fill the voids between the fine aggregate or sand particles, but to toughen the mixture and increase its resistance to displacement under traffic. Very fine sand grains do not serve the latter purpose satisfactorily, but such materials as limestone dust, portland cement and slate dust have proved to be excellent fillers and are usually specified for this purpose. It is ordinarily advantageous to use as much filler as the mix will comfortably carry without interfering with its uniform spreading and compaction. This is largely dependent upon the amount of sand passing the 80-mesh sieve which is present in the fine aggregate. Except for mechanical difficulties attending its use, dry clay free from lumps or balls makes a satisfactory filler, and as a matter of fact it may be noted that a patented type of pavement has been devised in which the mineral aggregate consists entirely of clayey earth at least 40 per cent of which should pass the 200-mesh sieve.

Hot-Mix Construction.—The most desirable consistency or grade of asphalt for use in asphaltic concrete and sheet asphalt pavements is largely determined by climatic and traffic conditions to which the pavement will be subjected. In general, the warmer the climate and the heavier the traffic, the harder should be the asphalt cement. For asphaltic concrete penetration, limits of 40 to 50, 50 to 60, or 60 to 70 are commonly specified, and for sheet asphalt the usual limits are 30 to 40, 40 to 50 or 50 to 60. The following construction details should be given particular attention in order to secure best results with any of the hot-mix types of asphalt pavements:

1. The character and grading of the mineral aggregate should be under the constant and careful control of an inspector at the paving plant.
2. All batches of paving mixture should be correctly and uniformly proportioned, preferably by weighing each constituent of the mix, and the plant inspector should be sufficiently experienced to determine just what proportions within specification limits are most desirable to adopt.
3. The paving mixture should leave the plant at such temperature, within specification limits, as will insure its arrival on the job at a sufficiently high temperature to permit of proper spreading, raking and compaction.
4. The mixture should be laid only when weather conditions are such that the surface is not rapidly chilled, thus forming a stiff crust which prevents proper compression througnout its entire depth.
5. Careful and uniform spreading and raking are essential to securing a surface of uniform contour. Carelessness in this detail cannot be corrected by rolling, and an uneven contour in a newly constructed pavement is apt to lead to rapid development of waves or bumps.
6. The hot mixture should be compressed as soon as possible after raking and should be conscientiously continued by an experienced roller man until no further compaction is possible. Rolling should proceed at an average rate of not more than 200 square yards per hour per roller. Maximum initial compression is highly desirable and may frequently best be obtained by using a 3-wheel 10- or 12-ton roller.
7. The contour of the pavement should be tested before rolling is discontinued, and corrected where necessary by suitable means before the mixture has become cool.

Asphalt Block.—The fourth type of asphalt pavement, known as asphalt block, is a pavement in which the wearing course is constructed of blocks composed of a dense, fine graded asphaltic concrete subjected to heavy compression during the process of molding. These blocks are laid in regular courses, as in the case of brick pavements, and vary in thickness from 2 to 3 inches. A special grade of asphalt differing in certain respects from the regular paving asphalts is required for asphalt block manufacture. Asphalt blocks should ordinarily be laid upon a 1½-inch bed of cement sand mortar, although they have been successfully used under favorable climatic and traffic conditions in certain localities directly upon a sand foundation.

Foundations

There are fully as many types of foundations which are satisfactory for use with asphalt wearing courses as there are types of asphalt pavements. Thus gravel, broken stone, Telford, portland cement concrete, and asphalt base, commonly known as black base, all have their place in the design of asphalt pavements. Moreover, almost any type of existing road or pavement which has reached its limit of economic and useful life as a wearing surface may be utilized in some way as a foundation for a new asphalt pavement. The annual salvage value of such old worn-out roads in this country is tremendous, and a large part of the original investment in their construction is lost if the old material is removed and replaced by a new type of construction. This portion of the original investment, which for old worn-out gravel and macadam roads alone has been estimated at about $200,000,000 annually, may be conserved by utilizing the old roads as foundations for asphalt pavements.

Subgrades.—First of all, it is necessary to consider subgrades. For some years past much has been said and written regarding the importance of subgrade preparation and drainage, but little real improvement is to be noted in ordinary practice. It has been demonstrated that all known systems of drainage have very decided limitations of effectiveness and that the bearing power of certain soils under natural local conditions will, in spite of drainage, be so low as to necessitate the adoption of relatively costly designs of pavements to carry the traffic. It is also known that subgrades composed of certain soils will with ordinary drainage successfully carry almost any traffic if their surface is protected with a thin pavement which will not shatter under impact. Economical methods of modifying the characteristics of soils of poor quality so as to greatly increase their bearing value when wet have also been known for many years, as evidenced by the wide-spread development of the sand-clay road, and yet in the construction of high-type pavements this information is not put to practical use. The subject of subgrade modification is, however, receiving the constantly increasing attention of those actively engaged in highway research, and it is to be hoped that construction engineers will soon begin to reduce the test results to practice. In the last analysis, foundation construction, for flexible pavements at least, may be considered largely as a method of subgrade reinforcement.

Gravel and Broken Stone Foundations.—A new gravel foundation should be allowed to consolidate and season under traffic for a period of at least six weeks before an asphalt pavement is placed upon it, and during this period it should be carefully maintained so that there will be no uneven, loosely bound areas to cause breaks or depressions in the asphalt wearing course. It is also highly desirable to follow the same practice where a new broken stone foundation is to be used, and during construction the voids should be filled with screenings so as to obtain as nearly as possible the same degree of stability as is found in old well-constructed macadam roads. For a 2-inch asphalt pavement a new gravel foundation should seldom be less than 8 inches thick, and a new broken stone foundation seldom less than 6 inches thick. Where the subgrade is of poor quality and the traffic heavy, considerably thicker designs should be adopted. As a matter of fact, under such conditions it is much safer to adopt some type of asphalt base with a relatively thin subbase of gravel or broken stone.

Asphalt Foundations.—There are three types of asphalt bases or foundations, known as the asphalt macadam base, the asphalt sand base, and the asphaltic concrete base. Asphalt macadam base is constructed in one or two courses 3 inches thick, in much the same manner as the asphalt macadam wearing course, except that somewhat less asphalt is required per inch of thickness and the seal coat is omitted.

The asphalt sand base, which has been successfully used in certain sandy sections of the country, notably the eastern portion of North Carolina and in Florida, is composed of a mixture of local sand and asphalt prepared and laid hot to a compacted thickness of 3 or 3½ inches directly upon the sandy subgrade. Such a base with a 1½- or 2-inch sheet asphalt wearing course has proved highly serviceable and economical for light and medium traffic.

The most extensively used type of asphalt foundation is the asphaltic concrete base, which is composed of a coarse graded asphaltic concrete quite similar in character to that used for asphalt binder course, except that the maximum diameter of the coarse mineral aggregate may be as great as 2½ inches. Durable pavements have been constructed in the state of California with an asphaltic concrete base only 2½ inches thick and an asphaltic concrete wearing course 1½ inches thick, but in most cases the thickness of the base is not less than 3 inches and may run as high as 6 inches, which is then laid in two courses. Where subgrade conditions are bad and traffic heavy, it is often desirable to lay a 3- or 3½-inch asphaltic concrete base upon a subbase of broken stone 3 to 5 inches thick. A relatively thin asphaltic concrete base may also be advantageously used to salvage an old gravel or macadam road which is too thin to be used directly as a foundation and is thus made to serve as a subbase.

With the same amount of care in subgrade preparation, there is probably less chance of failure in a flexible foundation such as the asphalt base than in a rigid type of foundation. This is due to the fact that because of its flexibility it seeks to maintain constant and intimate contact with the subgrade and thus utilizes the supporting value of the subgrade to the maximum extent. Under many conditions that produce cracking in a rigid foundation, the slight yield of an asphalt foundation will maintain the pavement intact.

Rigid Foundations.—In entirely new construction, portland cement concrete is frequently used as a foundation for asphalt wearing courses. In cities where subgrade conditions are generally good, a foundation thickness of 6 inches is ordinarily ample to carry the weight of traffic, and if precautions are taken in country highway construction to see that the subgrade is properly prepared, consolidated and drained, more than 6 inches of concrete foundation will seldom be required; in fact, where subgrade conditions are favorable, 5 inches or even 4 inches of concrete may be sufficient. The mix need seldom, if ever, exceed the proportions of 1:3:5, or one part of cement to nine parts by volume of total aggregate. The use of a rich concrete base is not only an unnecessary extravagance but may actually produce less satisfactory results than the lean base; especially where conditions tend to produce considerable movement through expansion and contraction, any cracks formed in a rich base are apt to be wider than in a lean base, thus producing open joints and corners which are known to be a source of weakness. Moreover, wide cracks in the foundation are almost invariably carried up through the wearing course of the asphalt pavement. For the same reason it is not considered advisable to place construction joints in the concrete foundation, although some tendency along this line has been shown in recent designs of portland cement concrete bases.

ACKNOWLEDGMENT.—From a paper presented at the Highway Engineering Educational Conference, Clemson College, S. C.

1924-1925 FELLOWSHIPS IN HIGHWAY ENGINEERING AND HIGHWAY TRANSPORT

For information regarding these fellowships and regarding the nineteen professional short-period courses in highway engineering and highway transport to be offered by the University of Michigan, application should be made to Prof. Arthur H. Blanchard, 1026 East Engineering Building, Ann Arbor, Mich.

Forward Steps in Municipal Affairs

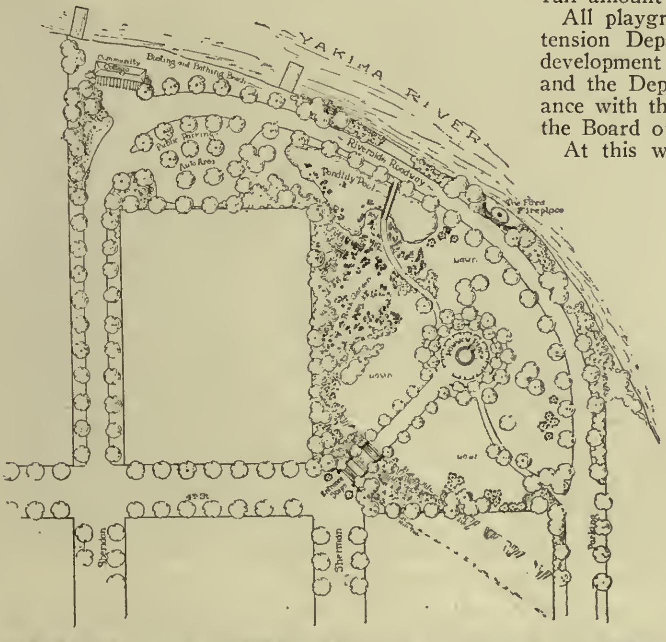
A Community of 2,000 Plans Its Fourth Park

Prosser, Wash.—A four-acre tract of land, ideally situated along the bank of the Yakima River, has recently been acquired by the city of Prosser for use as a picnic park, and is being laid out in accordance with the landscape plan reproduced herewith. This is the fourth park to be developed by this small community in the ambitious park-building program which it has undertaken.

The site of the new picnic park was used by Indians many years ago as a camping ground. When crossing the country from the Cascade Mountains and their winter camps at Naches, en route to the Blue Mountains, Umatilla, Walla Walla and eastern Oregon, the Indians forded the Yakima River at this point, and many cache holes, sweathouses and other evidences of these former occupants are still to be found in the neighborhood. This spot was known by the natives as Tap Tat, and we propose to give the park this original name or else that of some Indian.

As the park lies at a bend in the river, where the water is still and wide, the picknickers have an excellent opportunity for boating and swimming. At the southern end of the park the ground is covered with big boulders and this part will be converted into a rock garden. The rest of the soil is fertile and will be laid out with lawns, trees and shrubbery. A splendid beginning was made along this line on Arbor Day this year, when the business men of Prosser turned out in a body and planted almost two hundred trees. The members of the Woman's Club did their share by serving a noonday luncheon to the workers. A community house, a rock rostrum and other improvements are being planned, and these will be carried out as soon as the necessary funds can be secured.

W. C. SOMMERS,
Park Superintendent.



LANDSCAPE DEVELOPMENT PLAN FOR RIVERSIDE ROADWAY, PROSSER'S PICNIC PARK

Milwaukee to Have Playground Within Quarter-Mile of Every Child

Milwaukee, Wis.—The Board of Public Land Commissioners, realizing the need for an enlarged playground system for the city of Milwaukee, made a comprehensive survey of existing conditions and anticipated future growth. The findings and recommendations for a solution of the problem were set forth in a report to the Common Council in November, 1923.

The report recommended enlargement of the seventeen playgrounds then in use and the addition of thirty-six playgrounds so located that no child would have to walk more than one-quarter of a mile. Playgrounds were divided into two groups, junior and senior, the former for younger children and having an area not less than three-quarters of an acre; the latter for the larger children, having an area of not less than three acres. The anticipated cost of such a development was estimated at $550,000. The report was accepted by the Common Council and a bond issue for the full amount was authorized.

All playgrounds will be supervised by the Extension Department of the School Board. The development will be done by the Park Department and the Department of Public Works, in accordance with the plans and specifications prepared by the Board of Public Land Commissioners.

At this writing three of the new playgrounds are completed and ten are in process of completion. When the fifty-three playgrounds are in use, Milwaukee will have one of the most complete systems in the country from the standpoint of proximity to the children. Realizing, however, that the proposed size of the areas is inadequate, and that additional areas must be acquired to accommodate the future growth of the city, a ten-year recreational program is now being worked out to take care of the future needs.

It is interesting to note that the $550,000 bond issue, authorized by the Council and voted on by the people for playground purposes, passed with a larger plurality than any other bond issue in the history of the city.

GARDNER S. ROGERS,
City Planning Engineer.

Protecting a Village Milk Supply

WELLSVILLE, N. Y.—Experience and observation have shown that bacterial counts and the scoring of dairies do not accomplish much unless founded upon the control of milk handling; for there is little relation between the dairy scores and the quality of the milk. The dairy with the highest score may sell milk with a bacterial count well up into the millions, while, on the other hand, some inexpensively constructed dairy of the old-fashioned type, where the score is so low that the dairy would be excluded in many cities, may produce the cleanest milk.

For these reasons it is important to examine the milk as well as the dairy, and to know that the milk itself is clean. As a matter of fact, the cleanliness of the milk is of much more importance to the consumer than is the cleanliness of the barn.

The way in which the milk cans are cleansed and sterilized is one of the chief causes of the high count in some milk. A can that is thoroughly cleansed with steam or boiling water and placed right side up with the cover on and left 24 hours until required for use again, will contain from a tablespoonful to half a teacupful of water from the condensation of the steam. In this water will develop enormous numbers of bacteria, ready to show in the milk to be placed therein. The cans should be placed right side up uncovered, until the steam is evaporated. They should then be placed inverted on racks with covers off, and remain there until again required for use.

Bacteria and dirt are two different things, and the statement that milk with a million or more bacteria per c.c. is a dirty milk, is not quite fairly put. Dirt carries large numbers of bacteria, but it rarely gets into market milk in quantities large enough to produce such important effects on the bacterial count as do improperly cleansed utensils. Dirt is one thing; bacteria are another. A glass of clean buttermilk would never be classed as dirty, yet it contains enormous numbers of bacteria. Sterile sand would be classed as dirt, yet it contains no bacteria.

Poor milk is more often offered in midsummer than at other times of the year. It is usually claimed that this is due to poor cooling of the milk in summer-time. It is at least possible that the greater portion of the bacteria found in fresh milk come from the increased growth of bacteria in the utensils before the milk is put into them, rather than to the milk itself.

JASPER W. COLLER, M.D.,
Health Officer.

Baltimore Installs Fire-Fighting Equipment of Record Size

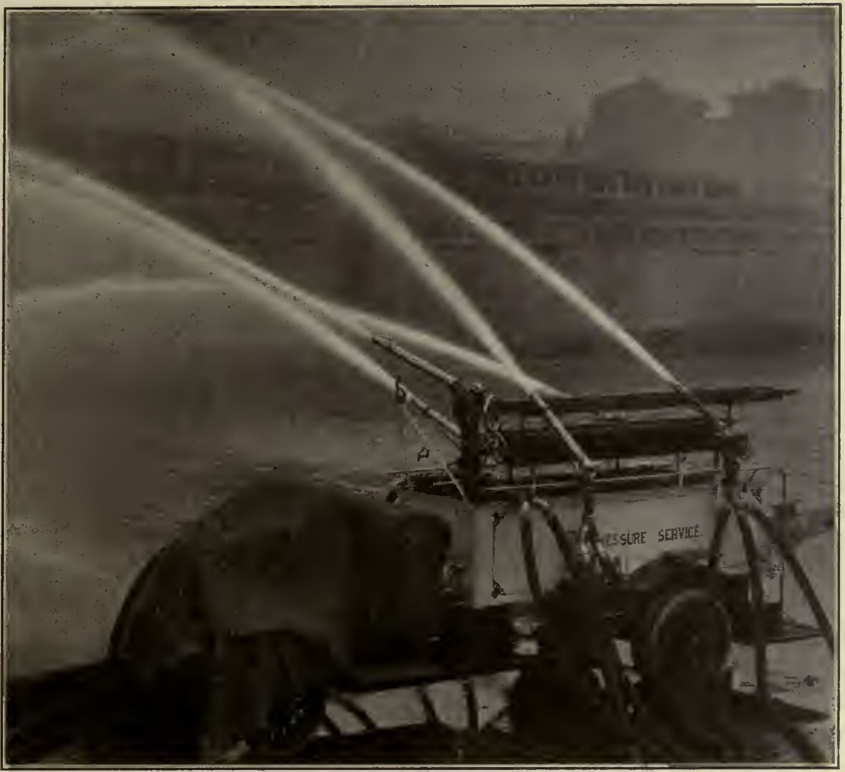
BALTIMORE, MD.—The extensive oil storage districts of Baltimore, which are among the largest in the country as to acreage and gallonage, have been given exceptional protection from spread conflagration. After nearly three years of successful operation of a test Foamite pumping engine, built in the shops of the Baltimore City Fire Department, with the cooperation of the engineering force of the Foamite-Childs Corporation, the Mayor and Board of Estimates of Baltimore recently authorized the Board of Fire Commisioners to purchase from that company a huge new Foamite pumping engine, the largest ever constructed, the bulk of which can be better realized when it is stated that the engine when fully charged weighs more than 16 net tons.

This big engine has been placed in service in the heart of what is known as the eastern oil district of the city, and will answer all first alarms of fire in that section. The small engine, which was built as a test more than three years ago, will be placed in service in what is known as the

BALTIMORE'S NEW PUMPING ENGINE

The Baltimore test was witnessed by a notable gathering of officials, including (left to right) Commissioner James Oyster, Chief of Police of Washington, D. C.; Chief Emrich of the Baltimore Fire Department; Chief Watson of the Washington Fire Department; Tighlman Pitt, Commissioner, Baltimore Fire Department; Major Daniel Sullivan, Commissioner, Washington Fire Department; and Walter O. Hough, President of Commissioners, Baltimore Fire Department

southern oil district. Both companies will be on special call for oil fires of all kinds in all parts of the city.



NEW HIGH-PRESSURE WAGON, BALTIMORE FIRE DEPARTMENT

What is believed to be the largest high-pressure wagon ever constructed for fire department work has just been turned out by the Fire Department's shops. This giant was particularly designed for use not only from leads from the high-pressure main system in the congested area, but also as a feeder and adjunct to the fire-boat service along the water-front. Baltimore now has four high-pressure companies in actual service, with three on reserve, but the last product of the shops greatly exceeds the other wagons in water-throwing capacity.

This wagon, when hooked to the fire-boat Torrent, recently delivered from five monitor nozzles mounted on the top and sides a total of 11,828 gallons of water per minute. To accomplish this result, the fire-boat led fourteen 3-inch lines, four being connected to the largest pipe mounted on top of the apparatus, two lines leading to each of the forward pipes on the two sides of the car, and three lines leading to each of the two pipes on either side of the rear of the car. The full capacity was secured with all five pipes at work and with the fire-boat turning over one of her twin centrifugal pumps.

The wagon will carry 2,500 feet of 3-inch hose and will be a very effective feeder for the fire-boats where inland leads of considerable distance are to be undertaken.

Where a concentration of streams as a battery is desired in the high-pressure district, part or all of the pipes of the wagon could be put in service, as the Baltimore high-pressure pumping plant has a capacity of 18,000 gallons per minute, which would leave a reserve of 7,000 gallons per minute above the supply of this wagon, in addition to the fire-fighting ability of the regular pumping engines of the department from the low-pressure water-mains, which are entirely distinct from the high-pressure service.

AUGUST EMRICH,
Chief of Fire Department.

A MAYOR BECOMES PRESIDENT OF THE CHAMBER OF COMMERCE OF THE UNITED STATES

Richard F. Grant, elected President of the Chamber of Commerce of the United States on July 1, is Mayor of the village of Bratenahl, a suburb of Cleveland, in which he lives. Mr. Grant is an officer or director of many important business corporations. Among others he is Vice-President of the M. A. Hanna Company, of Cleveland; President of the Susquehanna Collieries Company; and a director of the Cleveland Trust Company. He is a former President of the Union Club of Cleveland, and of the Cleveland Chamber of Commerce. During the war he was a member of the War Finance Committee of the American Red Cross.

What Is a Proper Bridge Approach?

An Exchange of Letters Introducing Helpful Ideas

Editorial Note.—In the February, 1924, issue of THE AMERICAN CITY an article on "Outstanding Problems in Highway Bridge Design," by E. F. Kelley, Senior Highway Bridge Engineer, U. S. Bureau of Public Roads, contained the illustrations and captions here shown. E. E. East, Highway Engineer of the Automobile Club of Southern California, Los Angeles, Calif., took exception to the illustrations, his letter being transmitted to Mr. Kelley for reply. We publish the exchange of letters, as we believe they are helpful discussions of the problem.

To the Editor of THE AMERICAN CITY:

On page 183 of the February issue of THE AMERICAN CITY is shown a picture of a bridge which collapsed by reason of "too narrow a roadway and an unprotected web system."

On page 184 is shown another photograph over the caption, "Well-designed Concrete Bridge with Approach Fill." In small type under this picture it is stated: "The full width of the approach fill is insured by the suitable wing-wall design. The flaring rails protect traffic and improve the appearance of the structure."

The point is, why should a bridge the width of which restricts a roadway be called "a well-designed concrete bridge"? The inconsistency of this is brought forcibly to one's attention by the photograph on page 183. A small increase in the cost of the bridge on page 184 would have given a roadway width equal to the width of the approach fill. I predict that the bridge shown on page 184 will be the scene of numerous accidents.

I am making the above criticism in the interest of public safety on our highways. We are too prone to accept highway design as being perfect and to place the entire responsibility for accidents upon the user of the road.

AUTOMOBILE CLUB OF SOUTHERN CALIFORNIA.

(Signed) E. E. East,
Highway Engineer.

A Reply from the Senior Highway Bridge Engineer of the U. S. Bureau of Public Roads

Mr. E. E. East, Highway Engineer,
Automobile Club of Southern California,
Los Angeles, Calif.

Dear Sir:

It is perhaps unfortunate that I used this picture (page 184) with my article, as the general layout is certainly open to criticism, in that the approach fill is on a curve and is not protected by guard-rails. I used this picture, not with the intention of conveying the idea that the whole layout was ideal, but because it happened to show rather well the wing-walls and flared-rail construction which I consider desirable. The caption "Well-designed Concrete Bridge with Approach Fill" is not my own, as I consider the approach open to criticism, but the words in smaller type beneath the caption are mine, for, in my opinion, the bridge itself is well designed.

As regards the approach, the objectionable curve eliminated a very dangerous turn in the approach to the bridge which this one replaced, and was probably the best layout that could be obtained at reasonable expense. It is my understanding that since the picture was taken the road has been paved, and it is probable that guard-rails are now in place.

The roadway width on a bridge depends on several factors which must be balanced against each other to obtain the best results which are practically obtainable, and the engineer is frequently far from being a free agent in adjusting the balance in accordance with his own ideas.

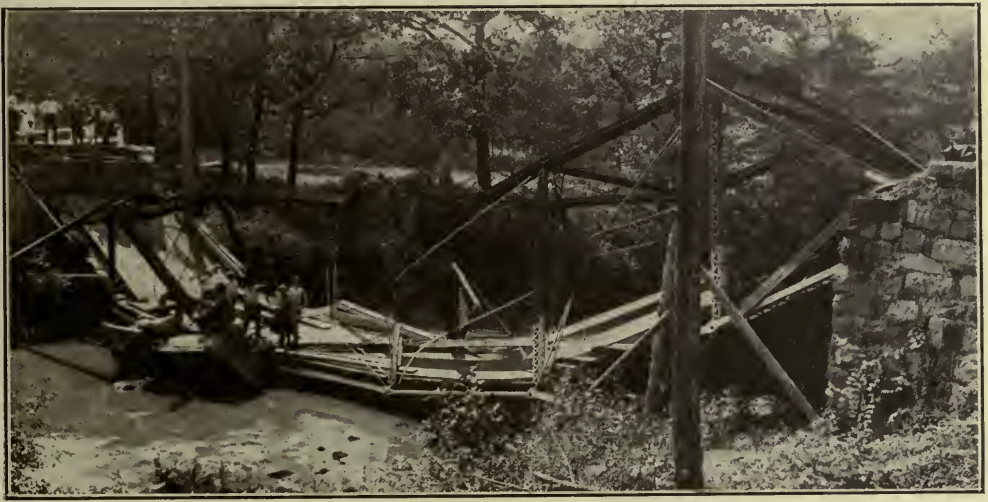
First, we must bear in mind always that the public pays for these bridges and that public opinion, whether right or wrong, is going to have a decided influence on the final decision. It is sometimes better to take half a loaf than none at all.

Second, there is the very important consideration of expense, and this, by the way, is very likely to influence public opinion without regard to the other factors involved. The roadway width is one of the governing factors in the cost of the structure, and, assuming that the bridge is an absolute necessity, it must be determined on the basis of traffic demand and the funds available.

In considering this question we cannot limit ourselves to one bridge, but must consider as a unit the vast bridge-building program which is before us. A percentage of additional expense which would not be important in a single case, might, if applied to the thousands of bridges which we must build in the near future, seriously handicap, if it did not wreck, the whole program. We must establish a policy which will enable us to do the most good with the money available, even if the results do not exactly coincide with our ideas of what is ideal.

I note in your letter the statement, "A small increase in the cost of the bridge on page 184 would have given a roadway width equal to the width of the approach fill." I do not have the exact figures for the width of roadway and approach fill at this location, but an assumption of 20 feet and 26 feet, respectively, will be close to the actual. This is a spandrel-filled arch structure, and, except for railings, spandrel-walls and wing-walls, the cost would be increased in direct proportion to an increase in roadway width. I believe it would be fair to estimate that a change in roadway width from 20 to 26 feet would increase the cost in excess of 20 per cent. This might not be too much for one bridge, but if applied to a large bridge-building program, definitely limited as to funds, would result in the continued use of old and dangerous structures which might otherwise be replaced.

I judge from the statement quoted above from your letter that you are of the opinion that the roadway on a bridge should be of the same width as the approach grade. As a general proposition, I cannot agree with that



ILLUSTRATIONS REFERRED TO IN THE ACCOMPANYING CORRESPONDENCE

As published in THE AMERICAN CITY *for February,* 1924, *the upper picture carried the following caption:*

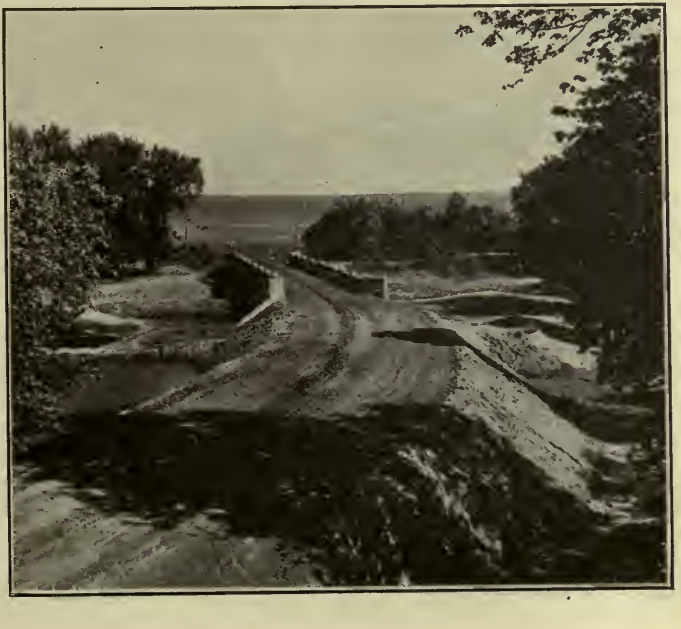
THIS COLLAPSE WAS CAUSED BY TOO NARROW A ROADWAY AND AN UNPROTECTED WEB SYSTEM

The bridge was totally wrecked when a truck and a passenger car tried to pass on a narrow roadway. The truck knocked out the unprotected web system of the truss

For the picture at the right the caption read:

WELL-DESIGNED CONCRETE BRIDGE WITH APPROACH FILL

The full width of the approach fill is insured by the suitable wingwall design. The flaring rails protect traffic and improve the appearance of the structure



opinion.

That portion of a highway which is designed primarily to carry traffic is the pavement. A highway grade is always built wider than the pavement, but the portion outside of the pavement is not usually intended to add greatly to the traffic capacity of the road. Among other things, the additional width of grade serves to furnish adequate support for the edge of the pavement, and to provide for occasional turnouts and parking space, and gives the security from possible accident which might be furnished by a guard-rail if there were no other considerations involved. The bridge forms such a small part of the total highway and the width of the bridge has such a great influence on its cost, that the expense of providing for the occasional turnout and for parking space on the structure itself can scarcely be justified. This argument is based, of course, on the assumption that the width of the pavement is adequate for the traffic and that the roadway on the bridge is at least as wide as the pavement and preferably somewhat wider, as I have recommended in my paper ("Outstanding Problems of Highway Bridge Design," published in the February and March, 1924, issues of The American City).

To return to the particular bridge in question, which I have stated is, in my opinion, well designed, it was built about ten years ago in an agricultural community in the upper Mississippi Valley. This community did not have unlimited funds for bridge construction and this was among the first of the modern bridges to be built in that community, so that its cost seemed very high to those who were still thinking in terms of the old-time highway bridge. It replaced a light steel structure dangerously located, and provided a sufficient width for the two lanes of traffic, which was ample for the traffic of that day and is still ample, for the pavements that are now being built in that section are of a sufficient width for not more than two traffic lanes.

I base my statement that this is a well-designed bridge on the following facts:

1. It is a two-way bridge in a locality where this width is sufficient for the traffic needs, as evidenced by the fact that the pavements in this locality are being built for two lanes of traffic.
2. The flaring wing-rails improve the appearance of the structure and protect traffic by increasing its visibility and preventing vehicles from running over the wing-walls.

The question of roadway width is an important one and I have written at this length to make my position perfectly clear. It is a question which cannot be arbitrarily decided for all locations nor decided without taking into account a number of important factors. I could not consistently defend the bridge in question if it were located on the Boston Post Road.

An exchange of ideas on disputed points is always valuable and I shall be very glad to receive any comments for or against my opinions which may occur to you.

(Signed) E. F. Kelley,
Senior Highway Bridge Engineer.

Street-Cleaning Methods in Palo Alto, Calif.

THE cleaning of the asphaltic, concrete and macadam pavements in Palo Alto, Calif., is done with a motor-driven suction sweeper and by a hand patrolling group consisting of three men, according to the Fourteenth Annual Report of the Board of Public Works, signed by J. F. Byxbee, Jr., City Engineer. A new and improved type of suction sweeper was purchased in October, 1922, to replace the old machine, which was about worn out and of insufficient capacity to take care of the new pavements which had been added during the last two years.

Present-day street cleaning consists essentially in removing the dust and litter in the gutters for a width usually of from 4 to 8 feet. Automobile traffic generally suffices to clean the rest of the street surface, or at least blow the litter to the gutters. The work of removing the gutter accumulation is best performed by flushing the fine material into the sewers or by picking it up when dry, with vacuum cleaners, and then hand sweeping the coarser litter. Palo Alto has adopted the vacuum process of cleaning, as the climate is dry enough to employ this method successfully and it seems less costly to operate than flushing.

The business district contains 1.3 miles of streets. It is swept once per day with the machine and hand patrolled by one man. The cost of this work averages $1,770 per mile per year.

The residence district contains 15.7 miles of paved streets, which are swept an average of twice per week and hand patrolled by two men. The cost averages $420 per mile of pavement per year. The total cost of street sweeping for the year, including first payment on the vacuum cleaner, was $11,524.50. About 818 cubic yards of refuse was removed by the hand sweepers, and 900 cubic yards by the vacuum cleaning machine.

Sanitation on the Catskill Watersheds

Riparian Ownership Creates Interesting Problems

By Thaddeus Merriman

Chief Engineer, Board of Water Supply, City of New York

AMONG the various questions which confront those who are charged with the responsibilities of maintaining the quality of a public water-supply is that which relates to the sanitation of the drainage area within which the water originates. Filtration would improve the quality of any water and, when used in combination with chlorination, will make the worst of waters potable. There is considerable sentiment against the use of these processes for making a bad water good. Many consumers would far rather see them employed for the purpose of improving the quality of a water that was already above reproach, and would rather see more work done toward the prevention of pollution, which means that more attention must be paid to the sanitation of our watersheds.

Sewerage Systems for Villages

This article describes the benefits derived by small communities in the area from which New York City secures its necessarily great volume of water for daily consumption by its people and industries. At first loath to accept the improvements necessary to protect the quality of the water-supply of the city, the communities are gradually accepting the enabling act which permits the city to install and operate sewers and sewage treatment plants.

Riparian Rights

The doctrine of riparian rights, which is the basis of the laws relating to the use of water in most of the states east of the Mississippi, may be stated as follows: The riparian owner is entitled to have the natural flow of the stream through his property undiminished in quantity and unimpaired as to quality. This, of course, is the most that he can expect. If he himself lived up to the doctrine, he could use none of the water and could not even interfere with the regimen of flow as in a water power. Neither could he do anything which might change or alter the quality of the water.

The effect of this doctrine is to impose an obligation on every riparian owner, while at the same time it confers upon each such owner a right as against all upper riparian owners. These rights may be of great value, yet they cannot be exercised except in a reasonable manner. Similarly, while the obligations imposed may be onerous, they cannot be insisted on except as they are themselves reasonable. And so it has come about that the principle of reasonable use is generally applied to all such cases. The answer to the question as to what constitutes reasonable use must be based on the facts and the circumstances of each particular case.

The health laws of our states abound with prohibitions against polluting our watercourses. But the law is silent as to how an owner may use, or to what extent he may contaminate, the water which comes to him and flows through his land. No one can secure redress from an injury unless he can prove that he has been damaged. Local boards of health are often lacking in sympathy, and any one who raises his voice because the water which is supposed to come to his land pure, does in fact arrive as more or less diluted sewage, is immediately set down as one who complains unnecessarily. More especially is this so when a municipality attempts to protect itself against the pollution of its water-supply. The diversion of water from one locality to another is, from the point of view of those within the watershed, an unreasonable thing because it constitutes an invasion of their territory and an interference with the rights they have so long enjoyed without hindrance and without feeling that damage was being done to anybody.

This was the position in which the Board of Water Supply of the City of New York found itself with respect to the general question of sanitation in the Catskill Mountain watersheds. The existing health laws were cumbersome and unwieldy. The sentiment of the people on the watersheds was opposed to the enactment of any measures which might, by interfering with the convenience of the moment, result in any expense whatever. This feeling, moreover, was fostered by an agitation founded on the belief that if such pollution as there was could not be removed, the city in self-defense would be compelled to buy up the entire area of the watersheds.

The first step looking toward the relief of the situation was that which resulted in securing, through legislation, the right to promulgate rules and regulations as to proper sanitary conduct and behavior. These rules became effective after approval by the State Health Department and after due advertisement. Shortly after these rules were written, arrangements were made with various private owners whereby the city was permitted to enter upon their lands and, without cost to the owner, make such changes and improvements as were necessary. It was not long before individual opposition dwindled and disappeared, but the agitation looking toward the acquirement of all lands in the watershed area by the city continued.

The situation with respect to the individual owner being thus provided for, the next step was to look toward the installation of sewerage systems in those villages which were possessed of public water-supplies. The first bill seeking to authorize the city to undertake such constructions was introduced in 1914. It was strenuously opposed on many grounds, among which the following are of interest:

(a) The procedure proposed is unconstitutional.

(b) The expense sought to be imposed on the individual property owner will be so great that the net result will be a confiscation of his property. In consequence of this condition, all of the lands in the watershed will be so depreciated in value that, in fact, they will have no value at all.

(c) The proposed provision for the exclusion of rain-water from the sewers is impossible because it would mean that the sewerage systems, if built, could not be used. All waters originate as rain-water.

(d) The climate in the Catskills is rigorous. Every winter all modern plumbing in every house would freeze and so entail great expense on every owner. On account of the great depth of frost penetration, the sewers themselves would freeze and break. The resulting overflow of vile and putrescible matter would cause disease and pestilence to flourish in these beautiful and now healthful communities.

(e) The large volume of sewage which would be collected by such sewerage systems could not be purified by any means known to science. The effluent, even if purified to the greatest possible extent, would utterly ruin and destroy the river channel all the way down to the Hudson and render uninhabitable large areas of country on both sides of the river.

The Enabling Act

With such irrefutable (!) arguments at their command, the objectors prevailed and the matter was permitted to rest. In the meantime at least one of the villages began to see the necessity of providing a sewerage system on its own account, and it then became no difficult matter to secure, in 1923, an enactment giving to the city the right to construct sewerage systems, provided that suitable agreements could be made with the authorities of the villages concerned.

The main points of the enabling act, Chapter 630 of the Laws of 1923, are as follows:

The city of New York may contract, with the authorities of any village located in the Catskill watersheds, as to the construction of a system of collecting and disposal works.

The city must pay all costs of the system, including house services up to the cellar walls of all buildings, and must operate and maintain the system forever.

The individual owner, when the sewer has been completed, must connect at his cellar wall with the house connections provided by the city.

The city is empowered to acquire any and all lands necessary to make the plan agreed upon with the village authorities effective.

The city, after the plans have been approved by the State Engineer, is authorized to use the public highways, roads and streets, provided only that satisfactory repairs and replacements are made.

The moneys expended for the carrying on of such work are to be obtained by the sale of corporate stock of the city of New York, such corporate stock being deemed to be the bonds of the city issued to provide for the supply of water.

There is little doubt as to the equities on which this enabling legislation is founded. The operations of the city of New York from the view-point of the people in the watershed are unreasonable. Theirs is an individual use of water and theirs is an individual pollution. The city's use is wholesale, and if such individual pollution as exists is detrimental to the city, it can be removed only at the expense of the party which benefits through the use of the water. The necessity of the municipality cannot be held to impose an added obligation on the private owner. Neither should the fact that the municipality must defend itself with respect to the quality of its water-supplies be permitted to impose on it any unjust burden.

Acknowledgment.—From a paper read before the annual convention of the American Water Works Association at New York City.

ARCHITECT'S DRAWING OF THE IMPOSING ENTRANCE TO THE BALTIMORE STADIUM

A Stadium in the City-of-the-Average

By Daniel N. Casey

Secretary, Harrisburg, Pa., Chamber of Commerce

THE American city-of-the-average covets a stadium.

The American spirit of play is exerting its attraction wherever people live.

A million boys played football last year under the tutelage of 15,000 coaches. It is modern places of play for the boys and the spectators that the average city now seeks. The stadium movement is growing rapidly.

Inspired by the several colleges which had completed their giant structures the year the World War flashed into flame, smaller cities now desire stadia which will accommodate the multitudes who jam the gates of playfields at interscholastic contests.

Not all stadia, as interpreted to-day, are ellipses, nor yet yawning bowls. In many instances they are enclosed playsteads, fashioned along modern lines, with a well-drained gridiron, sometimes a separate diamond and running-track, and then, towering on cement and iron supports, tall seats, underneath which are up-to-date accommodations. In a few places, the college saucer has been erected, but not many communities can stand the expense—nor is it warranted in all places, nor needed. The initial compelling thought usually is the desire to have a clean, orderly, adequate arena for the high school football eleven, and the new creation has been labeled a stadium.

And, as the cities get well into the business of erecting a stadium, the city of average size is nearly stunned by the cost. For this reason, after a complete plan has been prepared, the sections are built as the needed money is available or in sight. It is to analyze some of the existing stadia, discuss financial plans and costs, and see how the plant is operated and managed, that this article is written.

Financing the Stadium

Endowment by private individuals, municipal bond issues, park and playground appropriations, community campaigns, long-term tickets of admittance—all have their share in the creation of the playsteads. Committees of chambers of commerce, various luncheon clubs and different groups all over the country are searching for information as to the kind of stadium they should recommend, and seeking data as to how the money can be secured.

No compilation of information on this subject can be complete. There is no central agency through which the facts clear; no adequate survey could be made without lapse of considerable time—and when it was finished, other structures would already be started. So, various types of stadia will be referred to, financial plans will be discussed, and these will form a basis to assist the city-of-the-average committee in arriving at a decision.

Let no committee be misled—the money for a stadium does not come from the hat-swinger. It comes from those who contribute to every other community movement and it comes only after careful, painstaking effort, planning and organization. The committee must not be swept off its feet by the ardent spontaneous enthusiast who declares that, because it is an outdoor proposition of the sporting variety, money will come easily. The first few thousand will always come with comparative ease in any community movement of merit, but, like the soldier with the pack, it is the last long mile that puts it over the top.

A city-of-the-average will find that the stadium will require from $100,000 to $200,000, without considering the land. In some places land owned by the city or school board has been leased for ninety-nine years, so that the basic cost is virtually eliminated. The city must make a very careful survey to determine the type and size of the structure best adapted to the requirements and conditions. It must not be too large, but must be sufficiently flexible to permit additions, should years develop the need.

One very hopeful feature is that in almost every place where a stadium has been built, receipts from the high school football games have increased to a marked degree. Teams have taken on a new spirit; there has been an augmented interest among citizens to witness the games; and the attractive surroundings have acted as a magnet. This is especially true, naturally, in those cities which previously had poor grounds with uninviting environment.

Usually a commission of citizens is appointed by the City Council, which has charge of the stadium and the reduction of its debt. Its finances are received from the high school athletic association, after the expenses of conducting the various teams are deducted. In some places the stadium commission handles the receipts; in others, it receives a pro rata share of the net receipts and then receives the balance after other athletic expenses are met. Football carries the other high school sports.

The stadium commission may also rent the field on a straight fee. In some cities, where a baseball diamond has been laid out, professional nines use the grounds in the summer, thus providing another source of revenue.

Little need be said here about the college stadia. They are almost taken for granted today. They have blazed the trail.

Some Municipal Stadia

In the municipal stadium in Baltimore the Army and Navy game will be held November 29 next, prior to which the stadium will be expanded to house 72,000 people. The Baltimore stadium was built by the Park Board of that city out of park funds. Ground was broken May 9, 1922, and the work was completed in record time, the first game being played on December 2, 1922. The total cost so far is about a half-million dollars. The gross seating capacity will ultimately be 150,000. The net proceeds from the first game were over $13,000; the gross proceeds from the Navy-Princeton game were $76,421. It is expected that the proceeds from the stadium will prove it to be a real investment for the city.

In San Diego, Calif., a stadium was completed in 1915 with seating capacity for 30,000 people, costing $150,000, and financed by the sale of bonds voted for exposition improvements. The stadium is administered by the Board of Park Commissioners and is used for athletic events of all kinds; even a chariot race has been staged in the enclosure. It is also used for pageants, conventions, and military displays, the stadium at such times being converted into an open air theater.

Los Angeles has a coliseum whose cost was $800,000, which, with the added carrying charges on the notes to the banks by which the contract cost was paid, brings the total to approximately $1,000,000. The coliseum is built on land owned by the city, for which no charge was made. The facilities include athletes' dressing-rooms, capable of housing 1,000 persons at one time, four public toilet buildings, Western Electric Public Address System, lighting for night events, and in addition to the football turf there is a quarter-mile track and a 220-yard straightaway. The coliseum is managed by the Community Development Association and may be used by the city and county for public purposes.

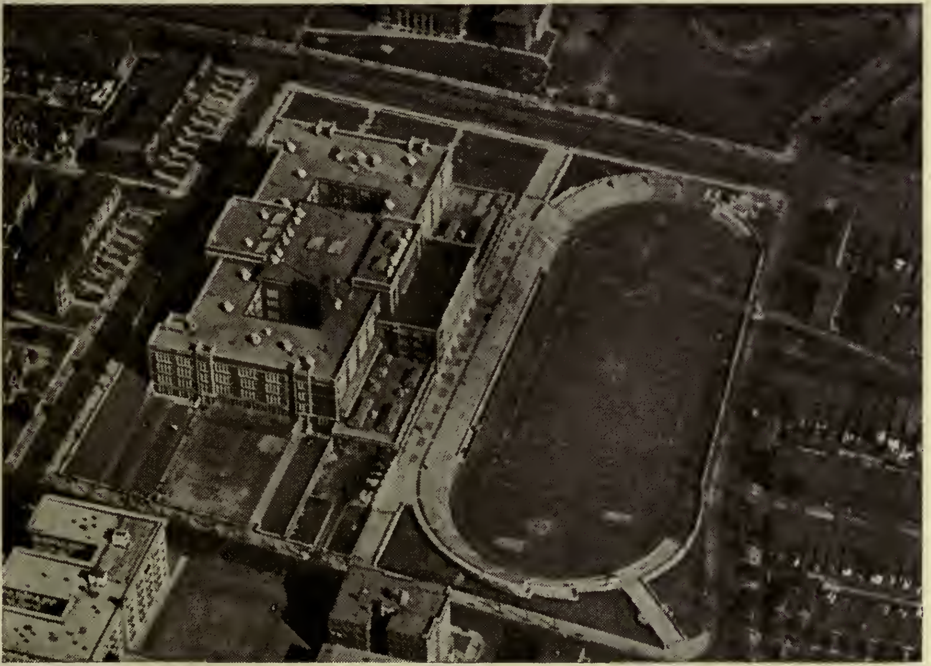
Pasadena's Rose Bowl has a seating capacity of 53,000, which can readily be enlarged to 75,000. It was completed in November, 1922. The real estate cost was $19,865; construction cost, $294,671; total, $314,536. The Rose Bowl covers 15 acres, and entrance to the stadium is through twenty tunnels running from ground level to half-way up on the seats. There are also two large tunnels capable of handling autos running from the ground level to the playing field. Part of the funds was secured by selling seats for five- and ten-year periods, payable in advance, the balance coming from bank loans. Part of the land was purchased, and part of it is city park land. The entire administration is in the hands of the Tournament of Roses' Association, a non-profit body which directs the annual New Year's Day parade and football game. The stadium is also used by near-by colleges for football games and by The American Legion for Armistice Day celebrations. The High School commencement exercises are now held there every year in June. It is also available for other large gatherings.

The municipal stadium in San Francisco is a part of the Golden Gate Park. It is an oval covering 30 acres, around which are arranged trotting-parks, footpaths, bicycle tracks, and cinder paths. In the center there are sections suitable for hammer throwing, vaulting poles, broad jumping, one basket-ball and six football fields.

The stadium was begun in 1905. The total cost for erection and up-keep to date has been $98,305. There was no land cost, because part of the park area was used. The San Francisco Driving Association supplied $25,000 as part of the initial expense, and the balance has been supplied from the park fund. The stadium is administered by the Park Department, which provides part of its budget for the up-keep annually. The stadium is available for the use of the general public at any time, all that is necessary being to make reservations with the keeper.

In Tacoma, Wash., the stadium is built in the form of a huge horseshoe with an arena containing 6.8 acres and comprising six miles of concrete seats, accommodating 40,000 people. The total cost was $150,000, met by popular subscription and by five-year tickets sold for $10. The stadium is administered by the School Board.

Chicago's great stadium, in course of construction, will be opened next fall. At that time 40,000 permanent seats will be ready for use and there will be provision for 30,000 temporary seats. When finally completed, the total capacity will be 150,000. The cost of the first construction is estimated at $2,500,000, and the final plan will run from four to four and a half million dollars. The stadium is built on the shore of Lake Michigan on land reclaimed by the South Park Commission, a separate taxing entity chartered by the state of Illinois, which operates the public parks on the South Side of Chicago. The South Park Commissioners administer the stadium. Money was secured by bond issue authorized by the voters. The stadium is primarily for public use and is planned to be used for athletic events and civic gatherings of various kinds. No part of this property will be used for private profit.



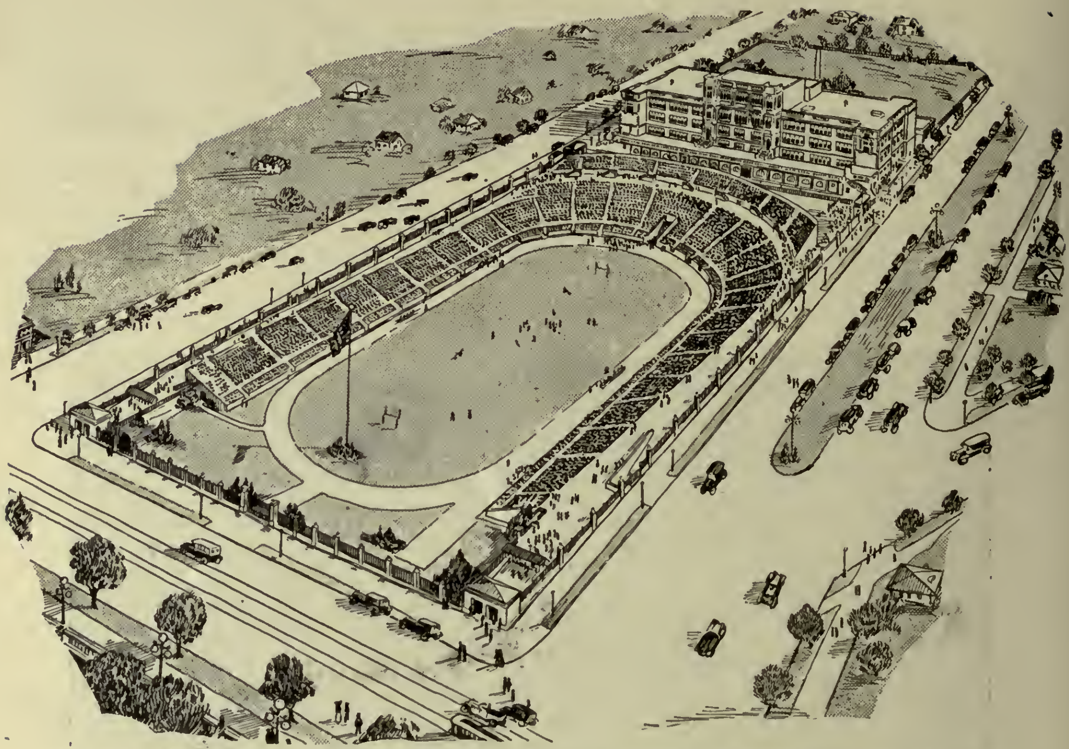
Courtesy of the National Education Association

CENTRAL HIGH SCHOOL AND STADIUM, WASHINGTON, D. C.

Pelham Bay, outside of New York, has a stadium with bath-houses, swimming pool, quarter-mile track, boat-houses, and a Mothers' House. It was created through a gift from Mrs. Isaac L. Rice of $1,020,000, to which the city added $268,000. It is administered by the Park Department and is open to all.

The municipal stadium at Denver, Colo., is being made possible by Regis College, Denver University, the Denver Motor Club and a private giver joining in the financing of the great structure. A Stadium Committee has been appointed by the Mayor.

In Louisville, Ky., and Evansville, Ind.,



THE STADIUM IN ERIE, PA., WHICH WILL BE READY FOR USE ON THANKSGIVING DAY, 1924

stadia have been built and are owned by the School Board. In Evansville, the School Board rents the stadium to a baseball league for seventy days, adding $2,000 revenue in this manner. The use of a wooden covering for the concrete steps is a feature of the Louisville Boys' Stadium. This covering is high enough in the rear to walk under and there are also features which make possible the erection of a canopy in case of rain. The Louisville stadium accommodates 4,300, and the Evansville stadium has 5,380 seats under cover and 1,400 bleacher seats without cover.

In Erie, Pa., a municipal stadium is being erected in a natural bowl on land owned and donated by the School Board. It is to be of concrete construction with seating capacity for 25,000 and including gridiron, diamond, and running-track. It will also be used for concerts and festivals. Through popular subscriptions $150,000 was raised under the direction of the Erie Chamber of Commerce. The stadium will be ready for Thanksgiving Day, 1924.

Nashua, a New Hampshire city of 20,000, plans to combine a community center club house with the stadium idea. A pond basin is to be drained, filled and leveled. There will be two diamonds, a football field, a quarter-mile track, eight tennis courts, and a permanent grand stand accommodating 4,000, with movable bleacher seats. The club house will contain a hall for community events, bowling-alleys, shower-baths and locker-rooms for the athletes. Entertainments are being held to raise funds, and the Knights of Columbus is one of the organizations taking the lead.

What Haverhill Has Accomplished

Haverhill, Mass. a city of 55,000 people, was the first city in the East to erect a high school stadium, and being a city-of-the-average, the facts are especially interesting.

The Haverhill stadium was made possible first by public contributions and then by bond issue by the city. The final cost in 1916 was $31,500, not including the land, which was virtually given by the city. Later, close to $50,000 was spent on new baseball stands, temporary football stands, completion of running-track, painting, repairs, insurance, and necessary supplies. Haverhill's stadium was created in a burst of interest and came into being because a group of energetic citizens put their shoulders to the wheel and agreed to see the thing through. The stadium is built on a

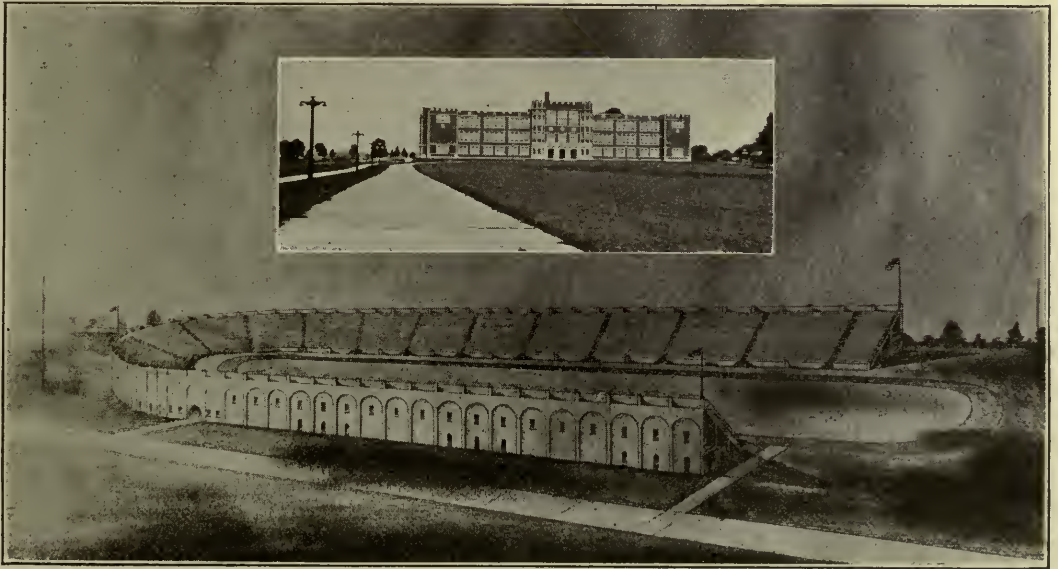
10-acre plot, of which 5 3/10 acres are enclosed with an 8-foot concrete fence. The fence itself cost $8,000, but is built to endure. There are wooden stands constructed on concrete bases and posts so that it is virtually a permanent construction. These seat about 5,000 people and skirt the gridiron. On the other side are stands seating 6,000, which are movable and which are converted into bleachers in the baseball season. Two years ago a grand stand, seating about 1,000 people, was built in the corner back of home plate. The running-track is around the edge of the gridiron and outside of the diamond. Much expense was put into grading and draining. This was very carefully done, with the result that rain or melting snow always drains off quickly. The stands have every modern facility, with shower-rooms, locker-rooms, toilets and heating and lighting.

The initial drive for the Haverhill stadium raised $13,000. In 1917 there was a deficit, covered by notes, still remaining, and an act was passed by the State Legislature in that year, giving the city the power to take over the stadium, to issue bonds to meet this indebtedness, and to create a Stadium Commission. The act reads that the money received by the Stadium Commission shall first be used for the up-keep and improvement of the stadium, and, secondly, shall be paid to the city. From this source $6,000 has been received by the city. The bonds issued in 1917 were four-year serial bonds totaling $16,000, the last of which will be paid when funds are available in the near future. There will then be no indebtedness on the field, except this moral debt of $10,000 between the Commission and the city—the difference between $16,000 and the $6,000 already paid.

The city of Haverhill, through its Stadium Commission, owns the land. The Commission has full charge of the up-keep and improvements of the stadium, and leases the field to the High School authorities. The City Council elects the members of the Commission, which is composed of three men, serving for three-year terms, with the Mayor and President of the School Board members ex-officio.

The School Board, through its business manager, collects the money taken in at the gate. At present there is a five-year lease, expiring in September, 1924, between the Commission and the School Board, by which the High School has the preference in the use of the field, for a rental of $1,500 each year, plus any receipts in excess of those necessary to run high school athletics through the current school year. The Commission usually receives between $8,000 and $12,000 each year from the High School. Professional teams have used the field at different times, the Commission having the power to let the field when and to whom it desires, subject to the High School's right to preference on all dates.

Results have been amazing. Income has increased rapidly with the development of the football team. For five years the Haverhill Eleven was undefeated. The team overwhelmed the big Boston teams, beat Scott



THE PARKERSBURG STADIUM AS IT WILL APPEAR WHEN COMPLETED
The small picture shows the new High School adjoining

PANORAMIC VIEW OF A FOOTBALL GAME

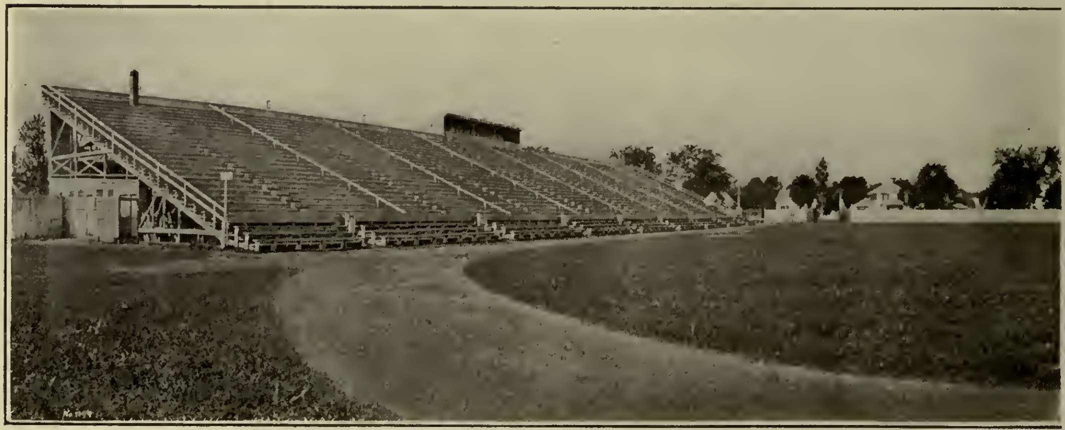
High of Toledo and Oak Park of Illinois, went to Jacksonville and defeated Duval. The Board would not grant permission for the team to go to the Pasadena Tournament of Roses to which it was invited. From 7,000 to 15,000 people witness the game every Saturday during the football season. With the Stadium Commission sharing in the receipts, it has been able to make material reduction on the deficit, as already mentioned, in addition to keeping the grounds in excellent shape and adding to the equipment and facilities.

Methods and Results in Parkersburg and East Orange

Another city-of-the-average which has been building a reinforced concrete stadium is Parkersburg, W. Va., with a population of 25,000 people. One-third of the stadium was completed in 1923. It is expected that it will cost ultimately $125,000. A local organization known as the Parkersburg Stadium Corporation was formed under the laws of West Virginia. The management of the corporation is in the hands of the Stadium Commission, composed of eleven members, of which two represent the Chamber of Commerce, with a similar number representing the Kiwanis Club, the Rotary Club, the Lions Club, and three members from the Board of Education. This Commission corresponds to the board of directors of any business corporation. The Board of Education granted to the corporation a 99-year lease on the ground to be occupied by the stadium and athletic field. The Corporation, on its part, is building the stadium, which will have an ultimate seating capacity of 15,000.

The northern section, seating 5,000, was completed in time for the 1923 football season, at a cost of $30,900, or $6.50 per seat. Work is under way for the building of the southern section. Each section is 300 x 65 feet, with back elevation of 31 feet. The curve section of the south end will probably be built within the next year. The athletic field, with enclosure, is of regulation size for football, baseball, and all sorts of high school and college athletics.

The stadium is immediately to the rear and



HIGH SCHOOL STADIUM, HAVERHILL, MASS.,

IN THE STADIUM AT EAST ORANGE, N. J.

south of the High School building, on a 27-acre campus. Looking from the front, one will face the back of the southern section, which will be finished with brick, in the style of the High School, and the space under it will be used for manual training and domestic science. Entrances to the sides will be of the stair type, and to the curved section of the tunnel type. Locker-rooms, shower-baths, etc., will be provided in the sections.

The work thus far completed has been handled through an issue of $35,000 in 7 per cent bonds, falling due in 10 years or at any interest period drawn by lot. All of the bonds were sold locally. Furthermore, as a means of getting sufficient working capital to start with, about 1,000 season tickets were sold in advance at a price of $5 per ticket for six games. These tickets were sold through personal solicitation by members of the civic organizations previously named. One-half of the admission receipts is credited to an athletic fund to cover current expenses of the athletic teams and other running expenses. The other half is credited to the Corporation and is used to pay interest on bonds, to retire the serial bonds as they fall due, and to cover incidental expenses. When the entire stadium is to be completed, additional bonds must, of course, be sold to raise funds for construction. When all the bonds are retired, either as they fall due or through previous purchase, the lease will be surrendered to the Board of Education and the stadium become the property of the city.

The stadium was designed by Folwell, Allen & Merrill, engineers and architects, of Parkersburg. These gentlemen donated their services and were reimbursed only for actual expenditures. The builders were Plate & Vogel, general contractors, of Parkersburg. Credit for working out the financing plan is due to H. W. Russell, an attorney, who also donated his services. The entire project was handled without a hitch, thanks to the excellent teamwork among the various individuals and civic organizations, the enthusiastic support of the newspapers, and the high degree of public

OWNED BY THE CITY AND LEASED TO THE SCHOOL BOARD spirit prevailing among the people of Parkersburg.

In East Orange, N. J., the receipts from the football games have made notable records. The gross receipts from the East Orange-Barringer game last Thanksgiving Day, which attracted the greatest outpouring of gridiron enthusiasts in the history of football in that section, totaled $13,000. When the East Orange men, who projected the stadium in the face of discouragements three years ago, went ahead with the plan to build it, they figured it would be at least five or six years before the total net receipts of a season would reach $10,000. The net receipts for the year 1923 were $11,435.35 and were used to reduce the note and pay the interest of 5 per cent on outstanding indebtedness. Twenty thousand dollars was borrowed from the Savings, Investment and Trust Company of East Orange, when it was found that bonds for $72,000 had been sold and that $95,000 was needed to complete the concrete stands. The $72,000 was raised by the sale of $10 coupon bonds almost entirely through the efforts of the East Orange school pupils. The records show that approximately 3,500 citizens are thus financially interested in this project.

Last year a running-track was put in, built by Frederick W. Rubien, of the Amateur Athletic Union, 305 Broadway, New York City, at an expense of about $5,000. The cost of this came out of the profits of the year. A number of track meets are scheduled for this year, which will pay a considerable profit. This summer there will be band concerts in the stadium, with a dancing-platform, and with refreshments served on the grounds, giving pleasure to a great many people who cannot get away from the city. In order to raise the money for the concerts a country fair was held three days in June, with the backing of some 42 organizations in the city. Tentative plans have already been considered for a winter carnival next winter. The stadium is actually the playground of the city of East Orange.

The Movement Spreads

In the loan bill introduced July 3 into the Philadelphia City Council there is included provision for a $2,000,000 municipal stadium. It is believed that there is no legal obstacle to the erection of a stadium in Fairmount Park, or to the charging of admission fees, but Mayor Kendrick recommends that the structure be built and controlled entirely by the municipality and not on park ground.

Anoka, Minn., a city of approximately 4,000 people, has a stadium with seating capacity for 1,600. The total cost, exclusive of the land, which was donated to the Commission, was $4,500. The money was secured by holding concerts for this particular purpose and through contributions. The stadium is administered by a committee of citizens and is free to every one in the community.

The Central High School stadium in Washington, D. C., is for football. The concrete pavilion seats about 8,000. There is some agitation for a large stadium on government property.

Peabody, Mass., has announced it is going to erect a stadium—and so it goes all over the country. City after city wants one. An actual need for a stadium, a definite plan, a knowledge of what is required as to size and facilities, a prospectus of what actual returns will ensue, a cost analysis, a well-thought-out method of raising the money, and then administration by an impartial, intelligent board, appear now to be the requisites.

Editorial Note.—A view of the stadium in Tacoma, Wash., will be found on page 467 of the November, 1920, issue of The American City.

PASADENA STADIUM, SHOWING PORTABLE PUBLIC ADDRESS SYSTEM IN USE

The Public Address System is mounted on a low-hung truck and housed in a miniature bungalow. It may be pulled to any desired location by means of an automobile. The horns can be mounted together on a tripod, or separately as the case may require

Chamber of Commerce Activities in Public Affairs

The Town Meeting Idea and the Modern Chamber of Commerce

By William C. Ewing

IN the opinion of many, the ideal form of municipal government in a democracy is that exemplified by the New England town meeting, in which the entire electorate comes together periodically to determine all the general policies and many of the details of community activities. The town meeting form of government is very elastic. It is compatible with the employment of a town manager; it approaches the commission form when much power is delegated to the board of selectmen. In its original form all matters were determined in meeting of the whole, the execution of the meeting's decisions being intrusted to the selectmen or such other boards or commissions as the meeting might determine.

The advantages of the town meeting are so great that it is often retained after the population has so increased as to preclude the possibility of an assembly of all the voters. The largest municipality operating under the town meeting form of government has a population approximating 40,000. In this case it has been necessary to limit attendance at the town meeting to a few hundred elected representatives. In general, the simon pure town meeting is inapplicable in communities whose population exceeds 10,000.

A very helpful way of approaching the solution of our American city problem is to consider the methods by which we can make the municipalities having a city form of government approximate the advantages of the town meeting. In cities of less than 10,000 population this can be done through the agency of general citizenship meetings at which public matters shall be unofficially discussed for the purpose of formulating public sentiment. In the larger cities the problem is by no means so simple; but it must be solved unless we are prepared to abandon the practice of democracy in our American cities.

The weakness of our situation is due to the fact that the control of municipal affairs has been left so largely to a few officials. The remedy can come only through a more general participation in community responsibility on the part of all elements of the population. The physician, the laborer, the manufacturer, the home-maker, the merchant, the clergyman, the teacher and the member of every other specialized group, has a peculiar contribution that he alone can make to the general welfare. In making plans for the city's development, the omission of any one of these points of view is likely to result in a warped city.

The most important thing in any city, then, is to arrange means whereby all of the special interests and special abilities within the city may function unitedly in planning and supervising the community's development. Such an organization of the local patriotism of the citizens would be unofficial, with no legal authority whatever; but it would be welcomed by every right-thinking public official as an invaluable aid in the performance of his duties as a representative.

In many small and medium-sized cities the chamber of commerce is organized on so representative a basis that it is able to perform this indispensable function. Where this is not the case, either the chamber of commerce or some other organized group may take the initiative in getting together representatives of all groups for the purpose of arousing the broadest possible interest and discussion of public questions and the contributing to the city's welfare of every kind of special talent.

The object to be sought is to bring to each citizen the conviction, held so tenaciously by the residents of small towns, that without his aid and counsel the municipality cannot attain its greatest possibilities and may indeed go on the rocks.

This object may easily be accomplished in the small city through an unofficial town meeting conducted by the chamber of commerce or improvement association. Its accomplishment in cities of the first class is a very complex task. In cities with populations under 100,000 the difficulties are not great, nor the necessary organization complicated. Modern psychology has emphasized the great extent to which we all function as members of various groups rather than as individuals. By the adequate representation of every group in the city in the citizenship organization which functions as an unofficial town meeting, it is possible at the same time to secure the special knowledge of each group in city planning, to create in each group an intelligent interest in public affairs and to secure citizenship cooperation in carrying out the plans which are determined upon. We should have the city government as at present existing, but constantly in touch with an aroused and intelligent public sentiment.

Such a central citizenship organization, if kept truly representative of all groups, will secure all the advantages of the town meeting without sacrificing the greater efficiency of the large-city form of government. It may indeed prove the salvation of our local democratic institutions and an important aid in the solution of city problems.

Municipalities and Chambers of Commerce Give Aid Which Makes Music Week Truly National

AMONG the factors which made the first synchronized National Music Week a triumphant success was the aid given officially by the municipality to the campaign in numerous cities. In some of these the city government appropriated a sum toward the Music Week treasury. In others the mayor acted as honorary chairman of the Music Week committee. Numerous Music Week proclamations were issued by the Mayors in such cities as New York; Boston; Pittsburgh; Los Angeles; Milwaukee; Sacramento; Galveston; Tucson; Austin; New Bedford, Mass.; Battle Creek; Paterson, N. J.; Quincy, Ill.; New Brunswick, N. J., and Johnstown, Pa. These proclamations were in line with the proclamations issued by the Governors of Ohio, Indiana, Arkansas and Hawaii. In addition, Governor Cox of Massachusetts issued a statement endorsing the Boston Music Week, which was the principal one of the observances in that state.

Aside from the municipal aid to the movement, perhaps its most effective stimulus, nationally, was the promulgation of the idea by the various chambers of commerce, or cooperation by the secretary in putting the National Music Week Committee in touch with the proper persons or organization to head the campaign locally. The sponsoring organizations were generally either a music or a women's club, a civic group or a recreation association.

Far exceeding the figure originally set by the projectors of the movement was the participation in the National Music Week, May 4-10. Previous to the 1924 observance, only 150 cities had ever held a Music Week. When the recent campaign was started, on December 1, the National Music Week Committee set 300 as the maximum number of cities expected to participate in the observance. Up to May 28 the number of community-wide observances, as shown by the reports reaching the Committee at its headquarters, 45 West 45th Street, New York, was just beyond the 480 mark. The Committee therefore expects that the final figures for city-wide observances will considerably exceed 500. In addition, there were a vast number of partial or fragmentary observances such as should bring the complete total to 1,000 cities and towns where Music Week was observed.

A history of the first National Music Week is shortly to be issued, and for that purpose the Committee has sent a questionnaire to the various Music Week committees. One important question asked therein is as to the permanent benefit that the local Music Weeks were expected to bring about in addition to the general benefit of greater music appreciation. Some of the benefits most frequently noted in the replies to the questionnaire are:

> The formation of a civic music association or municipal music commission
> Plans for building a civic auditorium
> Provision for musical instruments for the schools
> The establishment of community choruses
> The establishment of a municipal band or orchestra
> The appropriation by the municipality of more funds for civic music
> The institution of community sings in industrial plants
> Greater cooperation between musicians and musical groups

Once more will the observance of National Music Week begin on the first Sunday in May, the actual dates for 1925 being May 3-9.

Making Real Americans of Growing Boys

By Major F. L. Beals, U. S. A.
Supervisor, Physical Education, Chicago Public High Schools

EVERY community, both large and small, has its definite problems. Some of them are growing increasingly difficult, with the changing of our population from country to urban life. In times when the great majority of the population was in the country, boys were kept occupied with work which contributed to the general family welfare. With the shifting of the most of our population to larger communities, this condition has been changed, so that one of the great community problems of to-day is the profitable utilization of the long vacation period for boys. It can no longer be said that the larger the city, the greater the problem, because it is just as great for the town or small city as it is for the large city. Hardly a community but is making some effort to meet the condition and solve the problem, and each is going about it in its own way.

An interesting effort to solve the vacation problem for boys by means of a summer camp was inaugurated by the Chicago school system in 1919, and is now in its sixth year of successful operation. This institution—Camp Roosevelt—nationally known as "the boy-builder," is located on Silver Lake, near LaPorte, Ind., 65 miles from Chicago on the New York Central Lines. It is open to boys not only from Chicago, but from all parts of the country, and the fact that last summer twenty states were represented at the camp proves the necessity for, and desirability of, such a camp. Boys from 10 to 18 years of age are accepted, and three courses of training are offered. For the boy who has "flunked" in school and must make up credits, the summer schools are maintained. Seventh and eighth grade subjects and complete high school courses are included, and the credits earned are accepted by educators throughout the country, as the camp schools are accredited by both the Chicago school system and the Indiana State Board of Public Instruction.

For older boys who do not require or desire educational training, the Reserve Officers Training Corps (or military division) is open. This includes instruction in setting-up exercises, in drilling, school of the soldier, school of the squad, and military maneuvers, which are taught by officers and non-commissioned officers of the regular army who are assigned to the camp each summer for this purpose.

The Junior Camp is especially designed for the younger boys, from 10 to 14 years of age, and offers a life of romance and adventure out in the open.

JUNIOR CAMPERS' CLUB HOUSE AT CAMP ROOSEVELT, NEAR LA PORTE, IND.

The morning hours lend themselves admirably to the division programs, while in the afternoon, all boys in camp join in the athletics, and the evening entertainment programs include all in camp. Swimming, basketball, baseball, boxing, wrestling, high, low and broad jumping, pole vaulting, rifle shooting on the long and the short range, horsemanship, etc., occupy the afternoon hours. A troop of pure-blooded horses from one of the leading riding academies in Chicago will be shipped to the camp this summer, and instruction in equitation will be given by a riding master of renown. The seven weeks which the boys spend at Camp Roosevelt are so completely filled with wholesome, healthful activity of the finest kind that the boys are bound to benefit in many ways from their stay at the camp.

Because the camp is not operated for profit, the Red Cross lends it substantial support by maintaining a completely equipped hospital building and a staff of doctors and nurses who look after the health and sanitation of the camp and give daily instruction in first aid, swimming and resuscitation methods. The Y. M. C. A. hut is one of the popular spots in camp, and eight secretaries aid in looking after the welfare and comfort of the close to 600 boys who congregate there each summer. A group of public-spirited business and professional men, under the chairmanship of Angus S. Hibbard of Chicago, contribute funds to meet the deficit in the budget each year. Boys who attend are required to pay but a fraction of the usual rates for attendance at a summer camp, and they receive the benefits of instruction at the hands of experts in all branches of training.

Full particulars may be obtained at the Board of Education, 460 South State Street, Chicago.

If other communities would follow Chicago's lead in this matter of providing healthful, recreational activity for the summer vacation months, it is felt much good would be accomplished. The fact that Camp Roosevelt's patronage is so wide-spread proves this, and there are many boys who cannot even afford the nominal fee required at this camp who would receive inestimable good from just that kind of outing. When such opportunities are accessible to all, the cry for "citizenship training" and "Americanization" will diminish, for these outdoor camps can become a powerful factor in making our growing boys real Americans.

Studying the Future of a City's Fuel Supply

TO Buffalo, it is believed, belongs the credit for being the first city in which a municipal government has tried to look into the future of the city's fuel supply in as forehanded a manner as is customary with other engineering problems. The results of this study, recently made by G. S. Brewer, Assistant Fuel Engineer, U. S. Bureau of Mines, and Benjamin Joy Hatmaker, Consulting Geologist, Department of Public Works, Buffalo, N. Y., are embodied in a pamphlet entitled, "A Fuel Program," copies of which can be obtained from the Department of the Interior, Bureau of Mines, Washington, D. C.

In reply to an inquiry from THE AMERICAN CITY as to the basis on which other cities may secure similar cooperation, O. P. Hood, Chief Mechanical Engineer, Bureau of Mines, writes:

"In times past the answer to the fuel problem has been almost self-evident for any city, but with the exhaustion of certain supplies there will be an increasing need for careful city planning for future fuel. The city smoke problem is essentially one requiring a long look ahead and a patient waiting for results. To have a clean city in the next generation requires that we begin now.

"The Bureau of Mines is directed to make scientific and technologic investigations concerning the efficient use of fuels and the elimination of waste. When a problem of general interest is presented by any community that will finance a study, the Bureau of Mines is always glad to cooperate. In this particular case a Bureau engineer was furloughed for a time and paid by the city, the Bureau planning the work and furnishing the general oversight."

Fire Departments Can Help Minimize Drowning Fatalities

"MUNICIPALITIES of sufficient importance to maintain fire departments should insist on their firemen being properly trained in artificial respiration and that the departments be supplied with small life-boats and necessary equipment, such as drags and first-aid appliances, so that they would be in a position to respond to aquatic rescue calls in cases of emergency."

This suggestion is made by Austin P. Saunders, writing for the National Safety Council, in the May number of the *National Safety News*. In emphasizing the importance of supervised swimming as an answer to the question, "What can be done to minimize drownings?" Mr. Saunders says:

"Bathing in unprotected or unsupervised localities undoubtedly is the cause of most summer drowning fatalities. This fact is apparent to any one familiar with the sight of the thousands bathing daily in comparative safety within the life-lines of large protected bathing areas maintained in our coast and inland lake and river cities.

"Swimming must be localized. Two things must be taken into consideration in the selection of localities. First, the bottom of the bathing area should be free from holes, quicksands, mud, boulders or material that might endanger or injure swimmers. Second, beaches should be adjacent to populous sections of the city.

"Organized prevention of drownings is not limited to larger centers of population, by any means. Comparatively small municipalities have problems to solve also, and while it is not reasonable to expect that towns or small cities can provide sufficient finances to equip their water-fronts with elaborate systems of protection, it is quite within reason to suggest that signs should be erected to prohibit bathing at the dangerous localities; that life-saving appliances could be placed where necessary; that safe bathing localities could be surrounded by life-lines, and trained men put in charge, thus making safe municipal bathing areas available for the citizens."

FIRE DEPARTMENT HEADQUARTERS AND FIRE-FIGHTING FLEET, HICKORY, N. C.

Evolution of a Small City Fire Department

By Earl Mullen

IF there is one municipal service that stands out above all others in the rapid growth of Hickory, N. C., during the last score of ears, it is Hickory's volunteer Fire Department. This department is responsible for the act that Hickory has the lowest insurance ate in the state.

The first fire department in Hickory was rganized by P. A. Rowe in 1904. Thirty olunteer firemen were recruited, and two and-reels, 1,000 feet of hose and a handful f nozzle equipment were purchased to protect he property of the 2,200 residents.

The following year one horse and a Pied-nont wagon were purchased by popular sub-cription, and the Department's first paid lriver was employed. The one-horse Depart-nent was adequate until 1908, when several arge factories were built in the city.

Claude A. Moser became Chief the latter art of 1908 and induced the city to make its irst purchase of a standard hose and ladder vagon. Another horse was purchased, and hief Moser, thirty volunteers and the equine quipment successfully protected property rom fire for four years.

The city manager form of government was adopted in Hickory in 1912 and, incidentally, a great deal of publicity was given the city for being one of the first in the United States to adopt this plan. Harry E. Whitener, present Chief of the Department, was chosen soon afterwards, and since that time has perfected the organization of a volunteer department that compares favorably with the paid departments of much larger cities.

Insurance Savings Finance New Apparatus

Chief Whitener's first action was to make a survey, which showed the city to be in need of additional apparatus, in order to continue its successful fire protection record. At the suggestion of City Manager C. M. Sherrill, the matter was first taken up with the Southeastern Underwriters Association, which advised the Chief that a substantial reduction would be made in the insurance rates if the city installed a standard hose and chemical truck. With reliable figures in hand, the Chief circulated a petition asking the people of the city to give, for the purchase of the truck, the amount that would be saved in insurance premiums over a period of three years. His request was responded to immediately. Over $9,000 was subscribed, but only $5,500 was required for the purchase of the apparatus, and the balance was returned to the subscribers.

Some time after the arrival of the new apparatus the Department was found almost helpless at a fire that occurred at the Hickory Manufacturing Company and that resulted in a loss of about $50,000. The stand-pipe pressure was not sufficient to handle a fire of this size, and the need of a pump was felt. This installation was made on the hose and chemical truck at an additional cost of $2,500, in accordance with an agreement with the manufacturers when the original purchase was made.

Increasing the Interest of the Volunteers

The thirty volunteer firemen and the chief were paid 50 cents for each fire alarm from the time of the Department's organization in 1904 until 1919, when their pay was increased to $2 an alarm, the amount which they now are given.

In 1919 there was purchased another piece of apparatus—a type 75, triple-combination, American-LaFrance truck—and the two-horse hose and ladder equipment which had been in service since 1905 was then abandoned.

Until 1919, while the volunteers were always loyal to the Department, it was difficult to keep them properly interested for the maintenance of minute-man efficiency. Chief Whitener solved this problem by compelling members to attend two meetings each month under penalty of a fine of 10 demerits for each meeting missed. Fifty demerits automatically expelled a man from the Department. The meetings were made interesting and the plan worked splendidly without the expelling of a single man.

Bonds were voted in 1922 for the erection of a $150,000 municipal building, and provision was made in this new building for large and convenient quarters for the men and equipment of the Fire Department. The firemen's home, which is directly over the stationhouse, was handsomely furnished by popular subscription. Pool-rooms, radio sets, shower-baths, library, fine furniture and draperies were provided for the firemen. Eight comfortable beds are occupied each night by three paid drivers and five volunteers.

Modern Fire-Alarm System Installed

Realizing that one of the big secrets in controlling a fire is the method of getting to it promptly, Chief Whitener decided to install a modern fire-alarm system some months after the Department moved to its present quarters.

As an inducement for the city to take prompt action in the matter, the Chief agreed to raise $2,500 in cash at once to pay the interest on a $14,000 complete four-circuit Gamewell system for a term of three years. The amount was subscribed in a week's time and an order for 34 boxes and complete apparatus was placed. Before the system was installed, in June, 1923, 16 additional boxes were added to the order, making a total of 55 boxes at an investment of $18,000. Fourteen turtle gongs have since been installed in the homes of volunteer firemen, which signal instantaneously with the 30-inch fire-bell in the municipal building tower.

A Fire Which Taught a Lesson

A fire at the Hickory Chair Company, located outside the city limits, occurred in the fall of 1923, and although the Department was badly handicapped for lack of hydrants, a $750,000 property was confined to $148,000 damage, During this fire, which raged for eight hours, both pieces of apparatus belonging to the city were away from their post of duty, aiding the suburb of Highland. Hickory, proper, was left unprotected.

Immediately following this disaster, Chief Whitener held a conference with Sherwood Brockwell, State Deputy Fire Commissioner. A survey was made, and in order to provide protection within the city limits, it was decided that the two trucks must be kept within that area at all times.

To give fire protection to the suburbs, additional equipment was required and agreement was reached whereby a type 75 triple-combination truck was purchased by popular subscription outside the city limits and given to the city of Hickory in return for protection from its volunteer Fire Department. The $12,500 for the purchase of this apparatus was raised in ten days. At this same time Chief Whitener recommended to the City Council the purchase of a modern service truck, and an order for it was soon placed.

Hickory's volunteer Fire Department now has more than $75,000 in modern fire-fighting apparatus and equipment, which serves an area of only 3¼ miles. The volunteer Department now numbers 40 loyal and efficient fire-fighters. The officers are: H. E. Whitener, Chief; L. D. Frye, First Assistant Chief; R. C. Buchanan, Second Assistant Chief; W. D. Wilfong, Captain; W. E. Gosnold, First Lieutenant; D. E. Shuford, Second Lieutenant; M. G. Setzer, Superintendent Fire-Alarm; A. H. Alexander, Secretary.

Bituminous Surface Maintenance

By E. A. James, C. E.
Consulting Paving Engineer, Toronto, Canada

THE purpose of this article is to draw attention to a few points on which depends to a large extent the durability of bituminous surfacing, and the efficiency and general success of the methods employed in this class of work.

Bituminous Surface Treatment of Macadam Roads

Assuming moderate traffic conditions, a properly maintained bituminous surface on a well-built water-bound macadam road offers at least the surface and traction advantages of a bituminous-bound road at practically the cost of a stone road. The unbroken surface is impervious to moisture and may be easily cleaned, while the elimination of wear in the body of the road permits a reduction of the crown and the consequent better distribution of traffic over the surface.

The durability of a macadam surface depends principally on three things:

(a) Stability of the subgrade

(b) Strength of body to resist impact of heavy traffic

(c) Keeping the surface intact

Given the first two, the third may be obtained by some form of bituminous treatment.

In planning surface maintenance it must be remembered that bituminous material of whatever form, whether asphaltic oil or tar, is not a wearing material, but only a binder. The conclusion must follow that for satisfactory results a filler of wear-resisting material—stone chips, fine gravel, or coarse sand—must be employed, the bitumen being used only to hold the wearing material together and to hold it to the road surface.

Of the three classes of filler mentioned, stone chips are easily first, their superiority lying in their sharp edges and consequent resistance to rolling. On the same grounds, fine gravel consisting of rounded pebbles has least to commend it. Coarse sand, when sharp and clean, has given satisfactory results, but emphasis must be placed on coarseness.

Treatment consists in sweeping the surface, application of the bitumen, covering with chips, sand or gravel, and patching holes and depressions. The object of sweeping is to leave a surface clean, and free from dust, to which the bitumen will adhere, for on the bond between the new coat and the old road surface depends the success of the treatment. Difficulty in sweeping arises from the fact that, especially on a road being treated for the first time, if swept too vigorously, the stones on the surface will become loosened and satisfactory covering will be impossible. If a rotary sweeper is used, care should be taken that the brush does not bear so heavily as to dislodge the surface material, and in no case do we recommend wire brooms.

A BITUMINOUS CARPET ON WATER-BOUND MACADAM IN YORK COUNTY, ONTARIO

Bitumen is used to bind the existing surface of the road by its ability to penetrate into the surface and to hold the wear-resisting material together on the surface, and also as a water-proof material and a dust preventive.

Application of the bitumen should be made during warm weather—the warmer the better. Since surface treatment should be carried out as early in the year as possible in order to leave the roads in best condition to withstand the heavy summer traffic, and as the weather at that time is not uniformly warm, the warmest days should, wherever possible, be selected for the work. The extra heat assists in the penetration of the bitumen into the road, and better adhesion thereto, and also gives it greater covering power, producing not only a cheaper, but also a better, surface. We have come to realize that the thinner a bituminous surface can be applied and still completely cover the road, the more satisfaction it will give.

Adhesion to the road surface is to be desired more than mere thickness. The coat will in any case not wear evenly, and a thick coat on wearing through will leave a perceptible depression in the road. The best present practice comprises light applications, regular patrol work to cover worn spots, and complete resurfacing when needed.

While common practice requires that the covering material shall be applied within a few hours of the application of the bitumen, it has been found advantageous in applying the first treatment on a stone road to leave the bitumen uncovered for a day or two, so as to secure the maximum penetration, acting on the principle of a priming coat of paint. Where such practice is employed, the application should be the lightest possible, and should be followed from one to two days later with a second light coat, and the chips, etc., applied as usual. In order that traffic may not be inconvenienced, the road may be treated for half its width at a time. Where the practice of treating half the road at one time is employed, the second half should be treated as soon as the first is ready for use, else the concentrated traffic on one side may cause considerable wear.

Where tar is used, it is not necessary that the surface be absolutely dry to insure proper adhesion; in fact, we have received excellent results on damp roads. With asphaltic oils, a slight degree of moisture is not objectionable; some road men go so far as to recommend it. In the case of asphalt we do not.

Covering the bitumen is of next importance. It has been pointed out that some wear-resisting material must be employed to carry the weight of the traffic, and it must be further emphasized that this material must be used in sufficient quantity to carry the traffic clear of the body of the bitumen, especially while setting, and thus prevent its being lifted on the wheels of passing vehicles. The minimum quantity recommended is 1 cubic yard per 100 square yards, and it may be advisable to increase this somewhat, depending on the quantity of bitumen used. On this basis, an 18-foot roadway will require approximately 100 cubic yards per mile.

Attempts have been made to use less than the quantity here recommended, but observation has strengthened the opinion that the saving of chips was false economy. Mechanical distributors for chips and sand are now on the market, and where these are used, the quantity, owing to more uniform distribution, may be somewhat reduced.

Patrol Maintenance Necessary

The greatest need of a bituminous surface-treated road is constant watching, which can be secured only through regular patrol. Periodical surface treatment is not sufficient; the road must be carefully gone over at short intervals and any bare spots immediately covered. A macadam road with the bituminous surface intact will hold together as long as its body is strong enough to carry traffic, but the same road will disintegrate as soon as the surface coat is removed, and disintegration will proceed at a much faster rate than in the case of an untreated road. The patrol work, though important, will not be expensive. Probably the cheapest arrangement will be a man with single horse and wagon, or two men with a one-ton truck, on which will be carried a barrel of bitumen and a supply of chips or gravel. When the whole surface is being treated, it will be well to leave a number of small stock piles of covering material in anticipation of subsequent patrol work. A few barrels of bitumen should also be reserved.

While patching is usually carried on before the application of the surface coat, the character of the materials used in patching and surface treatment has suggested a reversal of the operations, and many road men now leave patching till after the surface has been covered. This is generally for two reasons: First, slight depressions can be brought up to cross-section with no more work than sprinkling into them a small extra quantity of chips immediately after the bitumen has been applied. Being depressions, they will collect an extra quantity of bitumen, which will bind the extra stone placed in them. Second, the bitumen used for surface treatment has a larger percentage of the lighter oils than is in the material used for patching and, therefore, has a tendency to cut back and soften the bituminous patching material.

Maintenance of Bituminous Penetration Roads

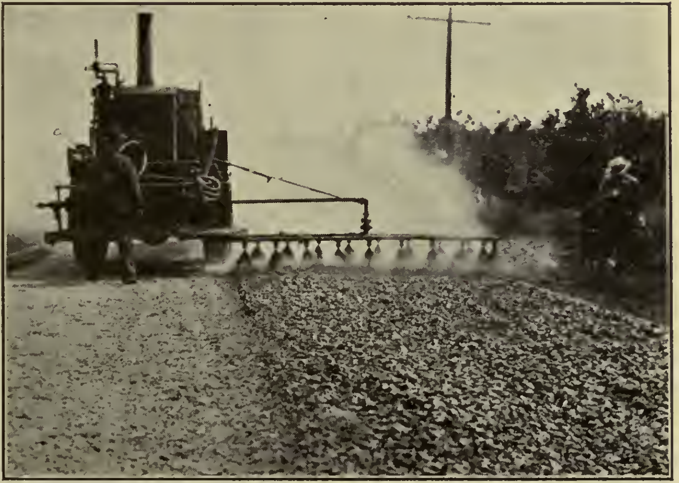
Maintenance of bituminous penetration roads comprises the patching or repairing of such portions as may have failed under traffic, the elimination of waves caused by excess or improper quality of bitumen, and the maintenance and renewal, as required, of the seal coat, which was the final step in construction.

Repairs may be rendered necessary through failure of the base or subgrade, or through bad spots in the surface caused by careless construction on poor materials. Where failure of the subgrade or base is clearly evident, satisfactory results will be obtained only by cutting out the defective section and rebuilding from the bottom up. If the damage has been caused by water in the subgrade, the repair should not be considered complete without a means of drawing off this water by tile drain or otherwise. If the wearing course only is defective, holes and depressions may be repaired by patching, and renewal of the seal coat. In the case of bituminous penetration roads where any patching is necessary, it is better to cut out the defective parts, cutting back to a line where the wearing course has its full thickness, and leaving the edges square with the base. After painting the bottom and sides of the holes with bitumen, cold-patch mixture may be placed and tamped, or, better, consolidated with a light roller. Traffic may be allowed over the patches within a few hours after they are consolidated, and the seal coat may be renewed later. For deep holes, that is, holes going right down to the base, 1-inch stone is best for patching. Where a roller is used, a small quantity of stone chips should be applied after consolidation and rolled also. For shallower depressions, the cold-patch mixture may be made of stone chips.

After years of experience, we have, however, decided that hot penetration repair work is to be preferred to "cold-patch." Heat the bitumen in the portable kettles and fill the holes with stone and hot bitumen, in alternate layers, taking care not to add more bitumen per square yard in the patch than was used in the original road.

Porous spots on the surface are an indication of insufficient binder, and, besides lowering the strength of the wearing course, tend to further weaken the road by admission of water to the base. Such spots frequently show up shortly after construction, and attention should be given them as the first steps of the maintenance program. If the spots are treated in time, a seal coat will be all that is required; if left, steps as prescribed for repairing holes will be necessary.

With bituminous penetration macadam properly laid, the principal maintenance operations will consist of renewing the seal coat as it wears down. This operation is carried out in the same way as the application of a bituminous surface treatment, and what has been said in that connection will apply here. Starting with a smooth and practically impervious surface, less oil or tar will be required, and the quantity of covering material may be proportionately reduced.



APPLYING THE BINDER IN THE CONSTRUCTION OF PENETRATION MACADAM IN YORK COUNTY

Waves in the surface, which constitute almost as great a source of inconvenience to traffic as holes, should be removed. Where isolated or few in number, they may be picked down, and the surface resealed, but where construction has been so faulty as to result in this defect on a large scale, satisfactory results can be obtained only by scarifying, reshaping, rolling, and the application of a small additional amount of binder, with a seal coat.

Surface Maintenance of Mixed Pavements

Maintenance of mixed or "hot-top" surfaces, in addition to caring for defects in the subgrade and base, and repair of potholes, as touched on in connection with other types, includes the repairing of surface cracks and, where the pavement is laid without curb or header, the care of the edges adjoining the earth or other shoulder. Repairs of the last-mentioned class are important, in that defects, if neglected, will result in serious damage to the road. Assuming that cracks are not caused by disintegration of the surface, they may be satisfactorily repaired by being thoroughly cleaned out and filled with bituminous binder, if possible of the same class as used in construction.

If the cracks are wide, they should be filled with stone chips after the binder has been applied and tamped. Where the edges have crumbled off, they should first be trimmed back to sound material, and a patching mixture of stone chips and binder used for filling, followed by a seal coat.

The unprotected edges of bituminous concrete pavements frequently give trouble through lack of protection. Considering the slight addition to the first cost, it is questionable whether any pavement of this type should be constructed without a curb or concrete header. The section of traffic turning out on the edge soon forms a trench for the collection of water, and the combined effect of the pounding of traffic and the disintegrating force of moisture and foreign matter soon causes wearing and breaking away, which in time will necessitate expensive repair work. This is especially the case when the shoulders are composed of non-porous material or where the drainage is poor. The first step is to supply surface drainage by cutting small trenches or scuppers from the edge of the pavement to the ditch, and in addition the non-porous earth or clay along the edge should be replaced with a stone or gravel shoulder, well tamped or rolled, to fulfill the double purpose of confining the pavement, and drawing off the water. Patching of a broken edge can best be done by cutting off the defective portions, down to the base, and rebuilding the whole course.

The methods of repair outlined in the two preceding paragraphs refer more particularly to repairs made by patrol gangs without the assistance of proper mixing plants. Where it is at all possible, repair work should be done by using the product of a mixing plant.

The crack, if wide, or hole should be trimmed with an asphaltic cutter until the edges are square and the material of a good quality. Narrow or shallow cracks may be repaired by being painted with a high-penetration asphalt. This product tends to soften the edges, and traffic closes the crack. The binder used in this repair work may correspond exactly with the binder of the original work, but the surface should carry bitumen of a slightly lower penetration, otherwise the patch will have a tendency to shove.

In recent years a blower attachment has been used, with an oil generator heat, to soften bituminous pavements. When softened, the uneven surface may be scraped until the inequalities are removed, when a new surface may be applied. This type of repair, if properly carried out, is just as good as cutting to the base and much less expensive.

With bituminous penetration and bituminous concrete roads, the need for constant watching is as great as with bituminous surfaced macadam, but the intervals of inspection may be made longer, and the work of maintenance and repair, thanks to the qualities of the more expensive types, should be less expensive.

Whatever the type of road under consideration, it is better to have a patrol crew continuously employed, the length of patrol depending on the amount of work required, rather than shortening the best and employing men intermittently for such work as may be necessary. In the latter case, defects are overlooked in their incipient stages, and even when repairs are really necessary, other occupations or interests may prevent the patrol man or crew from entering on or staying with their duties at the most important time.

Acknowledgment.—From a paper read before the Ontario Road Superintendents' Convention.

Toll-Bridges

It is interesting to watch the gradual elimination of the old-fashioned toll-bridge, once so common throughout the United States, now becoming somewhat of a rarity.

A decade or two ago there were several toll-bridges on the Mississippi River. Now there are few. The last Mississippi River communities to wipe out the toll across the river are those at Winona and East Winona. The Minnesota-Wisconsin bridge was declared a free artery of traffic on May 1, 1923, and tolls which had been collected since the bridge had been constructed became a thing of the past. The communities will, of course, benefit largely from the new régime.

The assertion has been frequently made that there is only one toll-bridge on the entire trend of the Lincoln Highway from the Atlantic to the Pacific seaboard. This is the local bridge.

The day seems to be coming when the people will have free access to bridges across all rivers. Developments of the past few years, with elimination of tolls on these bridges, seem to indicate that the day is now not far distant.

—Clinton (Iowa) *Advertiser.*

Street-Lighting Assessments in Toledo Compared with Those in Other Cities

TOLEDO is the only one of fifteen large American municipalities in which abutting property owners are required to share in the street-lighting expense. A survey of street-lighting methods and systems has been made by the Commission of Publicity and Efficiency of Toledo in connection with a proposed ordinance which would increase the property owners' share of the street-lighting cost, according to the *Toledo City Journal,* published by the Commission.

Under the present ordinance, the property owners and the city pay 50-50 for lights on the overhead system known as residential district lighting, and the property owners pay 85 per cent and the city 15 per cent for "white-way" or underground system lighting. The proposed ordinance would increase the property owners' share to 98 per cent.

This change has been proposed as one means of relieving the overburdened tax-supported department from a heavy expense item. It would reduce the city's share of the 1924 lighting cost from $102,000 to $10,000. Toledo's street-lighting bill for 1923 was $218,730, of which the benefiting property owners paid $134,658 and the city $84,072. At the end of 1923 there were 4,091 street lights, an increase of 314 over the previous year. This was fairly equally divided between the underground and the overhead system lights.

Requests for information on street lighting was sought from Detroit, Baltimore, Newark, Minneapolis, Seattle, Indianapolis, Rochester, Jersey City, St. Paul, Providence, Louisville, Oakland, Akron and Worcester. Of these cities only two, Seattle and Detroit, obtain their power from municipally operated plants. In the other municipalities, some pay private companies a flat yearly rate per light, as in Toledo, and some own the distribution system and only purchase electricity from the company. In not another city among those from which replies were received, except Toledo, were the property owners called upon to pay for any portion of the lighting cost. The *Toledo City Journal* claims that the latest practice seems to be to finance special municipal services, of which street lighting is one, by special assessment. The sidewalk and property of the abutting owner are illuminated, while at the same time the city's thoroughfare is lighted, which affords the city, as a whole, traffic and safety protection. It must be remembered, however, that the greatest benefit is to the street which is used for city-wide traffic.

Oakland, Calif., reported that it contemplated requiring property owners in a proposed high-intensity lighting district to pay for half the lighting cost. In Akron and Rochester, when property owners obtain street lighting in excess of what is deemed necessary or, in the case of Akron, in excess of the standard system, they are required to pay the difference. In a number of the cities the property owners are required to pay a portion of the cost of installation. The original construction of an underground system is paid by Seattle and St. Paul property owners.

It is somewhat difficult to compare street-lighting costs in different cities, but so far as this municipal service might be considered a burden on a tax-supported department, Toledo pays much less than most other cities. Toledo pays $84,072 out of the general tax revenue for street lighting, while Indianapolis pays $280,000, Jersey City $204,755, St. Paul $310,789, Providence $260,000, and Louisville $209,274. Toledo's total street-lighting bill of $218,730, including the property owners' share, is considerably smaller than those of other cities of approximately the same size. Adequate street lighting, with its attendant advertising value and protection from crime, cannot be secured under small appropriations for the street-lighting budget.

Too Many Types of Manholes

GROWING municipalities have a perennial problem in the extension of pavements, sewers, gas- and water-mains and conduits for telephone and electric distribution. Torn-up streets bring inconvenience to pedestrians, detours for motorists, and annoyance to the general public. Another side to the problem is the burden imposed on foundries, and indirectly on the taxpayer, by the innumerable varieties in sizes, dimensions, styles and patterns of manhole tops and covers.

The suggestion that varieties be simplified to a few patterns and sizes has been made to the Division of Simplified Practice of the Department of Commerce by a prominent industrial engineer. It is pointed out that no two cities in the west coast area use the same type or size of manhole tops. This condition is repeated in many parts of the country. A simplification and reduction in the number of sizes, dimensions and styles would enable out-of-town foundries to compete with local plants and broaden the sources of supply for the departments of public works. Oftentimes a municipality will have its manhole frames and covers made by a local foundry, but if anything happens to that foundry, the next time that city or town is on the market it must place the order elsewhere and pay again for the cost of new patterns. If a foundry is serving several communities, it must keep on hand a large variety of patterns.

Another phase of the problem is the relative low grade of material used in manhole construction. Manholes are often made from scrap iron, and a large loss comes through breakage in production which must be absorbed in the price of good pieces delivered. Just how many street accidents occur annually from breakage in use and the subsequent costs are not known, but several producers have stated to the Division of Simplified Practice that there is great need for uniform specifications calling for a better average grade of material.

Because of the interest shown and the suggestions already received by the Division of Simplified Practice, it is planned to call a preliminary conference in the near future to develop simplified practice recommendations covering manhole tops and covers.

Traffic Relief Through Parking Regulation

By J. Haslett Bell

Resident City Planning Engineer, Chattanooga, Tenn.

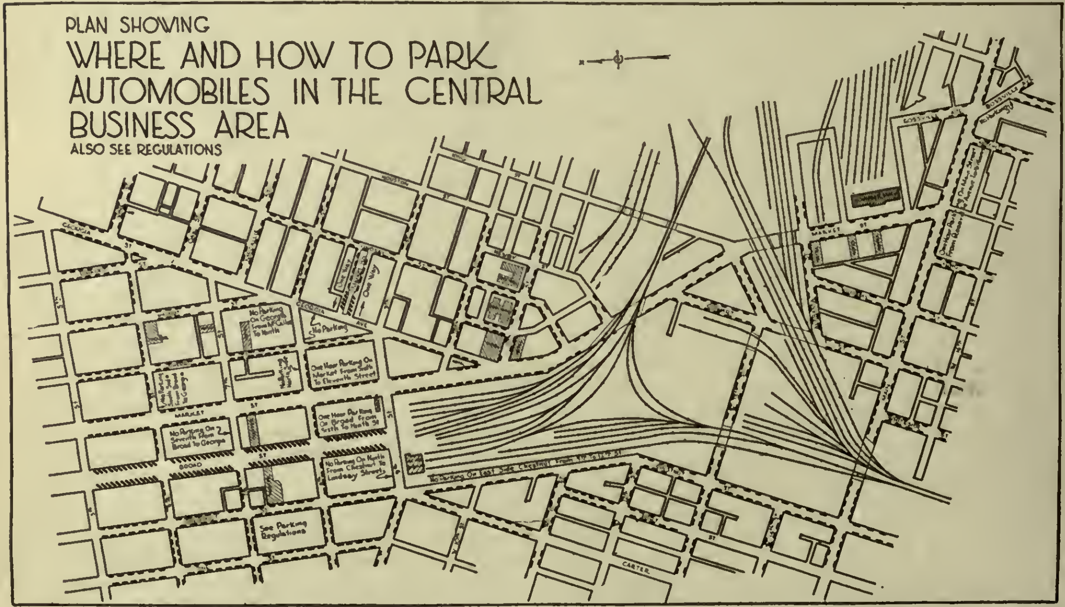
CHATTANOOGA is listed by the latest U. S. Census as having a population of 57,895. Its corporate limits are, however, well within the true boundaries of the improved area. The regional development is such that the city's streets handle traffic equal to that of a city of one hundred thousand population.

The existing street system is not a good one. There are very few through thoroughfares and wide roadways. The principally used streets are crowded, and the central business area to which they lead is struggling to take care of a large volume of moving traffic and of the demand for several thousand parked cars. Relief has been brought about recently, however.

Under the old parking regulations, Chattanooga allowed diagonal parking of cars, almost without exception, on the streets of the central business district. The main business thoroughfare, Market Street, had a time limit of two hours for cars parked during the day. Under these regulations the greater part of the roadways was taken up by parked cars, leaving only enough width for street cars and for one line of moving vehicles in each direction.

New parking methods were recommended by the office of Harland Bartholomew, City Plan Engineer of St. Louis, Mo., as a part of a major street plan for Chattanooga. These suggestions were put into effect by ordinance after being studied by the city. The new regulations call for parallel parking over the whole city, with the exception of one wide down-town street. No parking or parking-on-one-side-only is permitted on narrow roadways carrying a large amount of traffic. No parking is allowed on steep grades in the business district. The central commercial area, of some twelve blocks, has a time limit of one hour for parked automobiles from 7 A. M. to 7 P. M.

Great traffic relief was obtained by these changes in the business district. After the


PLAN SHOWING
WHERE AND HOW TO PARK AUTOMOBILES IN THE CENTRAL BUSINESS AREA
ALSO SEE REGULATIONS
GEORGIA AVE
No Parking On Georgia From McCallie To Ninth
No Parking
One Hour Parking On Market From Sixth To Eleventh Street
One Hour Parking On Broad From Sixth To Ninth St
No Parking On Seventh From Broad To Georgia
No Parking On North From Chestnut To Lindsay Street
No Parking On East Side Chestnut From 9th To 12th St
See Parking Regulations
One Way
MARKET
BROAD
CARTER
ST

CITY ORDINANCE.

"(a) It shall be unlawful to park any automobile or other vehicle between the hours of 7 a. m. and 7 p. m. on the following streets or parts of streets

"Seventh street, from Broad to Georgia avenue.

"Seventh street, south side, from Chestnut street to Broad street.

"Eighth street, from Cherry to Georgia avenue.

"Eighth street, north side, from Chestnut street to Cherry st.

"North Market Square, north side, from Georgia avenue to Lindsay street.

"Dewey street, south side, from Georgia avenue to Lindsay st.

"Ninth street, from Chestnut street to Lindsay street.

"Georgia avenue, from McCallie avenue to Ninth street.

"Georgia avenue, east side, from Ninth street to Market street.

"Chestnut street, east side, from Ninth street to Twelfth street.

"Rossville avenue, east side, from Main street to first alley south of Main street, West side from Main street to Read avenue.

"(b) That all automobiles or other vehicles shall be parked parallel to the curb on all streets with the exception of Broad street, where parking may be at an angle of forty-five degrees to the curb.

"(c) That it shall be unlawful to park automobiles or other vehicles for a period of more than one hour, between the hours of 7 a. m. and 7 p. m. in the district within the following boundaries:

"Beginning at East Sixth and Walnut, following the north line of Sixth to the west line of Chestnut, south on the west line of Chestnut to the south line of Ninth street; south line of Ninth to west line of Market to a point opposite the north line of Eleventh street; then north to a point opposite the north line of Eleventh street, then south on the east line of Market to the south line of Ninth and by the south line of Ninth to the east line of Georgia avenue, up the east line of Georgia avenue to the east line of Walnut extended and north on the east line of Walnut, to the starting point.

"(d) That it shall be unlawful to park more than one hour between the hours of 7 a. m. and 7 p. m. on Main street between Rossville avenue and Williams street.

"Sec. 3. Be it further ordained, That a violation of the provisions of this ordinance shall constitute a misdemeanor punishable by a fine of not less than $2 nor more than $50.

first "shock" of the new ordinance, practically every business man was "sold" on the new regulations. Streets were given one or more additional lanes for moving traffic, and there is less trouble from cars "cruising" for a place to park or backing out of a position at the curb. In the area now restricted to one hour, 13,308 cars are accommodated in the twelve-hour period. This same area accommodated but 3,969 cars under the old methods. Additional traffic may now be cared for in a more safe and efficient manner.

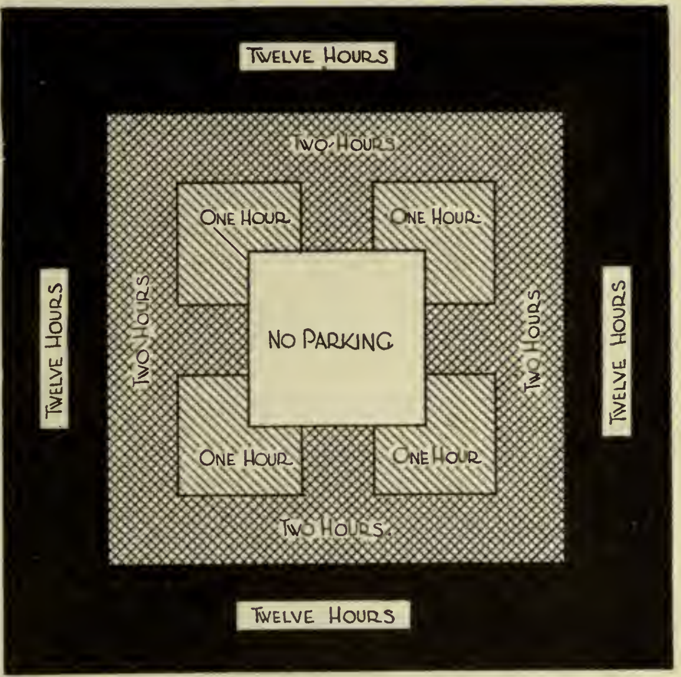


DIAGRAM SHOWING ARRANGEMENT OF PARKING TIME-ZONES. J.H.B.

The Future of Automobile Parking

Chattanooga has taken a common step forward. She has had to do what many cities have done and that many more will do as they grow. With a city's growth comes the increasing demand for more roadway width for the moving traffic and more restrictions for parked automobiles. The final result in large cities will be that in the central or most congested areas no parking can be permitted. Outside of this central district, traffic conditions warrant the formation of parking time-zones. These time-zones increase the time limits for parked cars, as they grade from the central or the no-parking area to the all-day or twelve-hour parking area. For example, outside the no-parking area would be the half-hour district, beyond this would be the one-hour district, then the two-hour district, then the six-hour district, and next the twelve-hour or all-day area.

It appears that there are two classes of automobile users that urgently need parking space near the no-parking or congested center. These are the man with a short business call, and the average shopper. The first individual needs from thirty minutes to an hour of time for his errands; the second person requires from an hour to two hours of time. The shopper should be provided with a place for his or her car near the retail stores and shops located in the no-parking area; therefore, the two-hour time-zone should at points touch the boundary of the no-parking zone, as shown.

This time-zone method of parking control is now, consciously or unconsciously, being enforced in some of our cities, but I doubt if it is wisely planned in many cases. Thought should be given to service to the parked car, as well as to the relief of moving traffic.

Probation Pays

PUTTING juvenile delinquents on probation results in rescuing many children from what might become careers in crime. This is the verdict of the Massachusetts Commission on Probation, appointed by the Massachusetts Legislature to find out what happened to probationers after they had been discharged from supervision. Nearly 300 boys between seven and seventeen years of age were included in the study; 239 of these boys, it was found, were carried through the original probation period without surrender and commitment. Sixty per cent of the boys discharged from probation to the community had no subsequent court record, and 87 per cent had not at any time been committed to institutions. In order to find out something about the habits and work records of these boys after their discharge, nearly 200 of those who had been put on probation in 1915 were studied during 1923. It was found that 78 per cent were steady workers and 87 per cent non-drinkers. The best showing was made by boys on probation for one year or more.

The Twentieth Century City

By William L. Bailey
Professor of Sociology, Northwestern University

THE present census reports more than 10,500,000 people living within 10 miles outside the borders of the cities of over 100,000 population. This is about 40 per cent of the population of the cities themselves. There are 10 cities whose suburban population is more numerous than their own. There are 30 such cities where the suburbs are growing more rapidly than the centers.

This tendency towards suburban development, which has become one of the outstanding movements of our national life, is relatively new. It was not officially noted by the Census until 1905, when a report on the suburban location of industries was issued. The suburban population grew 27 per cent between 1910 and 1920, and a great acceleration in this may be expected in the still sparsely settled territory contiguous to city limits.

Many European cities have even more marked developments of the same character, the suburban population in a number of cases exceeding several times that of the cities proper. The newest large cities of Australia, South America and Canada have notable phenomena of suburbanization.

The Twentieth Century City Is a Suburbanized City

A prominent city planner has recently said that city interests of all sorts have been looking to the "center," but must soon begin to regard "the circumference." This applies to planning and zoning, but also to every phase of municipal government and every phase of civic and social progress. It applies to church interests, to the schools, to recreation, and to welfare problems. It affects politics of the city and the county in very vital fashion.

Albany, Lowell, Springfield (Mass.), Norfolk, Scranton, Providence, Pittsburgh, Youngstown and Boston are centers to vicinities whose population outnumbers their own. For a dozen cities the suburban zone includes more than 100,000 people. New York's suburbs alone represent a population almost as large as that of Chicago, and comprise one-quarter of the suburban population of the entire country. Boston's suburban belt of more than a million people represents an outstanding development. Pittsburgh, for industrial reasons, has, so to speak, "turned inside out." Philadelphia as yet exceeds Chicago in the importance of her suburbs. Los Angeles, Providence, Cincinnati, St. Louis, Detroit, San Francisco, Cleveland—all with more than 100,000 people in their immediate vicinity—have suburban problems that must be recognized.

The most rapidly growing suburban districts are those tributary to Detroit (with an increase of 228.9 per cent between 1910 and 1920), San Antonio (125 per cent), Los Angeles (106.4 per cent), Cleveland (86 per cent), Akron (80.6 per cent), Seattle (79.9 per cent), Chicago (73.8 per cent), Youngstown (54.3 per cent), and Bridgeport (52.4 per cent. The suburban developments are more than double the rates of growth of the cities themselves in the first three of these cities.

A loss of population is almost unknown in the 1,500 communities that make up the suburban zones. Loss reported by the Census in 10 per cent of the number was nearly always due to changes of boundary.

More than half of the most rapidly growing cities of 25,000 or more population are suburban. Hamtramck and Highland Park (Detroit district) top the list with rates of growth (1266 per cent and 1028 per cent) seldom equaled in the history of American communities even in the earlier boom days. Gary, Long Beach, Cicero, East Cleveland, Lakewood, Clifton, West New York, Irvington and Oak Park are among the 23 places that have doubled population in the ten years.

The Most Changing and Constructive Aspect of American Life

Nine-tenths of this suburban population is in urban and incorporated communities. More than two-thirds of the suburban communities are of the small-city type. Many of the most advanced experiments in civic and social enterprises are located in these. Figures for building construction and for municipal improvements are evidence that here is the most changing and constructive aspect of American life.

Outstanding industrial experiments are represented in the suburbs of satellite character. The acme of industrial organization, and many notable experiments in welfare work, are found. The residential suburbs, on the other hand, show concentrations of wealth and high-class populations that result in schools and churches of the highest quality. The suburbs, too, of either kind, are being realized to be a frontier of opportunity by the newcome foreigner, and by the negro.

The rural problem in an intense fashion is also present. One and a half millions of "rural" population, often in unincorporated territory, is found in the suburbs. This is more in numbers than the total found in what is strictly to be called "open country" communities, that is, more than ten miles from any incorporated place.

A twentieth century form of agriculture and of rural life may be looked for in the suburban districts in the near future. At present these are generally the most neglected and backward portions of the farm world. But regional planning, by looking to the "circumference" of the city problem, will include all this in its comprehensive outlook.

And this new outlook will go far to reconstruct many a county. In more than 300 counties a single city includes more than half the population and brings every community in the county within 10 miles of a city of 10,000 or more inhabitants. Many even of the smaller cities, under 10,000 population, have their tributary towns and villages, often immediately contiguous. And they have relatively larger rural areas directly tributary than do the large cities.

American life to-day is largely and increasingly *suburban.* The twentieth century city which would be up-to-date in its outlook and projects cannot ignore these suburban developments.

Red Wing's Way with the Movies

By Florence L. Clark

RED WING, MINN., is giving an affirmative answer to two questions—does the public want clean shows? and can a community own and run a theatre profitably?

The story of the Red Wing Community Theatre begins a long time back, when Minnesota was in the dawn of white man's occupancy. Among the pioneers who blazed the trail to the new land was a young man named Taylor B. Sheldon. Opportunities to make money were plenty, and he became a successful business man in the hustling Mississippi River town. Life seemed good for many years, but in his declining days great sorrow came to Mr. Sheldon in the loss of all his family by death. Loved ones gone, his second best love, the town he had helped to build and the friends and neighbors who comprised its citizenship, became his first interest in life. The idea appealed to him to leave most of his fortune to the town and for some purpose which would give pleasure through the years to the home folks, young and old alike.

The T. B. Sheldon Memorial Auditorium, created out of a fund of $100,000 left to Red Wing by Mr. Sheldon on his death nineteen years ago, is the fullfillment of his wish. It is a beautiful building inside and out, finely equipped and attractively located—a finer theatre than is possessed by many towns a half-dozen times the size of Red Wing.

But the fineness of the building, equipment and setting is not the matter of chief importance. The significant thing is that the management consistently has maintained standards at the theatre in harmony with the ideas of the donor and the spirit in which the gift was given—and the enterprise, handled in this way, has been a distinct financial success. The profits each year go into a sinking fund. When this is large enough to put the institution on a solid financial basis for the future—and that time isn't far off at the present rate of accumulation—the already moderate admission prices at the theatre are to be reduced to just enough to take care of expenses.

A board of managers of five men appointed by the mayor runs the theatre. The board hires a manager at a yearly salary, a janitor, a doorkeeper, a ticket seller, and ushers. Seven or eight good plays are booked each season for single nights, and usually during the year two or three stock companies fill out week engagements. The rest of the time, the theatre is a community movie playhouse—a strictly censored one.

The manager's orders from the board are to screen none but clean pictures. He goes to Minneapolis to pick them out. After he has made his selection, the Board of Managers passes judgment. Next comes the Board of Censors, a separate organization of three mem-

COMMUNITY THEATRE, RED WING, MINN.

bers, appointed, like the Board of Managers, by the Mayor. When Red Wingites buy tickets at the window of the Community Theatre, they know that they are spending their quarters and dimes to see something clean and wholesome. Do they spend them when thus forewarned? The rapidly growing sinking fund is all the answer that is needed, though it really doesn't represent the whole profits, at that. Movie ticket receipts take care of the overhead expenses of many community meetings and entertainments which each year are given in the theatre without rental charge to the local organizations.

A Proposed Municipal Program for Rabies Control

THE Department of Health of the State of New Jersey has published in its bulletin, *Public Health News,* for May, 1924, a comprehensive article on the subject of rabies control, by Wallace T. Eakins, Assistant Epidemiologist of the Department's Bureau of Local Health Administration. The article shows an alarming increase in rabies among dogs in New Jersey during the last few years. It discusses symptoms of the disease in dogs and man; diagnosis, treatment and prevention; administrative problems in the control of rabies; anti-rabies campaigns and ordinances; and concludes with the following outline of a logical, workable program for a municipality:

"Although the inoculation of dogs against rabies is comparatively new to this country, enough evidence of its value has accumulated to warrant its inclusion in a rabies control program as a most hopeful new factor. There is much to be said for anti-rabic vaccination, as it aims to control rabies at its source—the animal; it is practically painless to the dog and obviates the necessity of muzzles as an anti-rabic measure. This should appeal strongly to the dog lovers and humane societies. The weakness of immunization is the fact that the length of time for which immunity is conferred is still in doubt, and until this is definitely determined the inoculation must be repeated each year.

In the light of our present knowledge of rabies, and the situation as we find it in New Jersey, it appears that a logical program for a municipality to follow to control rabies should include:

"1. Enactment by the governing body of an ordinance requiring the annual registration of all dogs, and requiring evidence that a dog has been vaccinated against rabies within one year as a prerequisite to registration.

"2. Active and continuous enforcement of such an ordinance by appropriate municipal departments —such enforcement to include capture and destruction of unlicensed dogs running at large, and an annual canvass of dogs.

"3. Enforcement by the board of health of orders requiring the destruction or confinement of animals known or suspected to have been bitten by an animal known or suspected to be affected by rabies.

"4. Furnishing by the local board of health of free Pasteur treatment for any indigent person who has been bitten by an animal known or suspected to be affected by rabies.

"The degree of success which would follow the adoption of such a program would depend on how vigilantly these measures are enforced. It is believed that a strict enforcement would reduce rabies to a minimum."

The Futility of Expecting Lower Costs of Public Education

A Resolution Adopted by the Department of Superintendence of the National Education Association at Its 1924 Meeting

THE unprecedented rise in the cost of public education as represented in the elementary and secondary fields may be traced to definite causes. It is the conviction of the American people that an education is the birthright of every child in this democracy.

Within the period from 1890 to 1920 it became necessary to expand the elementary school plant seventy per cent and the high school plant one thousand per cent, with like extensions in the instructing staff to take care of the ten million additional children in the elementary and two million in the secondary schools.

The increase in population, vast as that was for the period named, does not account for the increase in attendance. The real reason is the difference in conception on the part of the people as to what their school should be. Compulsory attendance laws brought children by the thousand into schools, the age limit was raised, and civic organizations inaugurated "back to school movements."

Growing Demands Increasingly Met

The public demanded physical and health education, courses in civics and patriotism, in fire and accident prevention, in music and drawing, in industrial and household arts, in science and commercial studies, expanded options in foreign languages and history, classes for the mentally and physically disabled, part-time and continuation courses, open air schools, night schools, summer terms; in short, a public service was demanded of the schools to meet changing domestic and economic conditions unheard of a generation ago. Local pressure and legislative enactment established the present public school program and changed public schools from places for the intellectual training of a selected few to public service stations whereby and wherein all might be equally served irrespective of race, color, creed, economic status or parental occupation.

If the present conception, which seems to be the creed of the American people, is to continue and the public schools remain public service stations, then it is futile to discuss a diminishing cost for public education. On the other hand, if every child of school age is to receive what is conceded to be his just due, namely, a full school day five days each week, the cost of school construction must go on. For example, two hundred millions are required at this moment for school construction in a single state if the children of that state are to enjoy this privilege.

Salary Levels for Teachers Must Be Maintained or Advanced

There is another factor in the recent cost of education. As late as 1917, salaries of teachers were proverbially and disgracefully low. Because of this, at no time in the history of American education has there been an adequate supply of trained teachers. At the present time, public education is suffering because of this lack. If public education is ever to have an adequate supply of trained teachers, millions more must be provided for our teacher-training schools. When an adequate trained instruction staff is had, the cause for the charge that "superficiality now obtains in public education" will have been removed. Prior to 1917, thousands of trained teachers left the the profession because salaries had dropped below maintenance level. The situation became so serious that public sentiment crystallized into a nation-wide movement for better salaries for teachers. This movement resulted in legislative enactment setting a minimum wage and annual increments. While teachers' salaries have materially increased in the number of dollars, there has been no corresponding increase in purchasing power. This movement, therefore, must go on. Present salary levels must be maintained and in many instances advanced, if we are to secure men and women of the same standards of ability and efficiency required in general business. If the schools are to Americanize the 13,000,000 of foreign-born now in this country and the millions more yet to come, if they are to banish illiteracy, if they are to take over the care of the health of childhood, and do the other things that the people now expect them to do, then there must be no expectation of a reduction in appropriation for public education, either state or local.

Can the Program Be Financed?

Can the nation finance the program? The late Franklin K. Lane placed the annual loss to the nation from illiteracy at $826,000,000; the Provost General places the loss due to remedial physical defects at still greater figures. In 1920, Federal statisticians place the nation's bill for luxuries at $22,500,000,000, a sum approximately equal to the cost of the government from the adoption of the Constitution to the declaration of war against Germany, a sum large enough to replace the public school plant from the ground up. The American people own fourteen out of every seventeen automobiles that the world has built.

It may be necessary to cut down expenses, but it should not be done by robbing childhood of its birthright. The remedy rests in a more scientific distribution of funds and the equalization of taxation. The destiny of the public schools is the destiny of the Republic; the nation of the future must pass through the schoolroom where the traditions of our free institutions are conserved and transmitted. What that future shall be rests with the American people.

A Study for a Modern Suburban Development

By B. Evan Parry, M.T.P.I.C., M.R.A.I.C.
Supervising Architect, Canadian Department of Health, Ottawa

THE fixed conditions of a site—what may be called its physical expression—must necessarily determine to a large extent the character of a well-planned development. In his ability to adapt plan to site lies, and will lie for all time, the test of the efficiency of the planner.

The plans here shown afford an excellent comparison between rectangular subdivision and that of modern development in an area of about 172 acres, bounded on the south by a river and skirted on the west by a canal, and situated within twenty-minutes street-car ride of a city.

In illustration "A" it will be observed that the street system shown—if lines at right angles to each other, such as any grammar grade school boy could plot, can be called system—would have the effect of straitjacketing the community's development. The difference in levels shown by the contours clearly indicates that in the planning of the roads economy has been woefully sacrificed. Direct means of communication between the boundaries of the estate have been ignored, thereby eliminating easy means of access and distribution. Wasteful expenditure and unsatisfactory development would be the result of this plan.

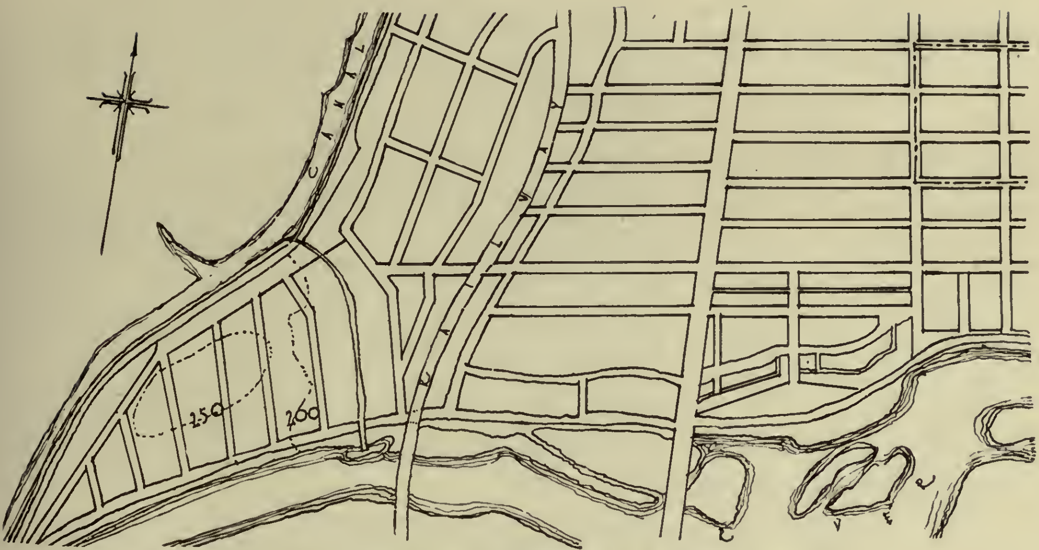
When the problem is approached on modern lines the objections referred to do not obtain, as can readily be understood by reference to illustration "B." Direct means of communication and distribution are established by the diagonal roads, contours have been studied to secure easy gradients, and the physical design in general is suitable for a real community—not merely a suburban dormitory.

Physical Development

There has been much confusion in the minds of engineers and city planners between a development efficiently constructed from the technical point of view and a development efficient from the social or community point of view. A system of parks and playgrounds which is laid out with the highest degree of technical skill, but is so planned as to make it inaccessible to a large majority of those whom it is intended to serve, is a social and economic failure. A street paved to a width vastly in excess of the needs of traffic is an economic burden on the taxpayer and presents a cost factor in housing that is sheer waste.

Communication is treated as of two entirely distinct classes; a circulatory system for all through, heavy or speedy traffic; and a distributory system for affording connection between the circulatory system and the residential system.

In the distributory street system, subject always to local topographic conditions, it must be recognized that the streets are virtually service lanes across which the houses generally approach the most closely. Where the housing is continuous and simultaneously carried out according to the scheme of improvement, disposition is made of the service pipes and wires by placing them underground, preferably in a combination conduit installed in the



PLAN "A"—A STRAIGHT-JACKET TYPE OF DEVELOPMENT

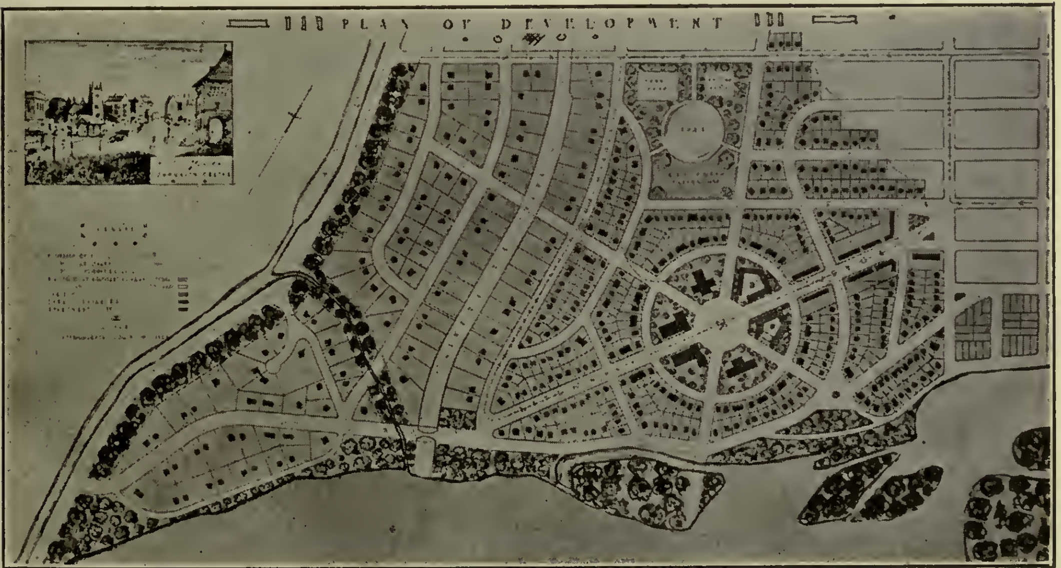
parking in the one excavation made for the sewer.

The basis of the plan is the diagonal road, which constitutes a main thoroughfare and is the most direct approach to the center of the city. This road opens up a number of fine vistas looking out on the river.

By having only one heavy-traffic route, a degree of safety is secured to the children, and the entire estate benefits from the resulting quiet and freedom from intrusion within strictly domestic areas, of all sorts of foreign interests.

Other principal features of the plan include:

1. The open square which forms an appropriate point of entrance to the property.
2. Construction of a direct highway from this square to the farthest part of the estate on the northwest side, where there is good undulating land.
3. Extension of existing roads to link up with a road running parallel to the railway on its east side and connecting with the diagonal. This route would be adopted as the route of the future extension of the car line.
4. Linking up of these diagonal and other



PLAN "B"—THE PROBLEM APPROACHED ON MODERN LINES

THE LIBRARY

The architecture of the library forms a contrast to that of the administrative building. "Its function is to house the books, wherein lies the soul of the whole past time; the articulate voice of the past when its body and material substance have altogether vanished like a dream"

routes by crescents and connecting roads, which would facilitate the means of communication and afford scope for development.

5. The reservation of portions of the land, including 20 acres along the river frontage, as public parks. It has been amply shown that not alone in subdividing with cheap land, but where the initial unimproved cost is as high as $2,500 per acre, improved neighborhood park playgrounds can be provided to the extent of 20 per cent of the entire site with no appreciable increase of cost per square foot of private lot.

6. Grouping of public buildings around a circle towards the center of the main avenue between the bridge and the square.

7. Reservation of sites between the circle and the square for apartment houses of two or three stories, with open courts, central heating and open surroundings.

The size and number of lots shown on the plan are:

Frontage of 100 feet or greater	117
Frontage of 50 feet or greater	199
Frontage of 40 feet or greater	174
Large lots for apartment blocks, churches, etc.	11

The largest lots are on the part of the estate most distant from the street cars. Lots 200 feet deep are shown backing on the railway for the reason that the railway right of way may one day become a main highway; and if so, these lots can be divided in two. But if the railway remains, the building owners will have large gardens with their houses considerable distance away from the railway line. The whole of the lots on the west side of the railway, which have a southeastern elevation overlooking the river, will be reserved for good-class residences occupying large gardens.

ADMINISTRATIVE BUILDING

To provide headquarters for the local government and a center for social and recreative intercourse. "The necessity does not arise in designing such a building to inspire awe, but rather to create confidence in the sympathetic outlook upon the doings of the community"

The general disposition of the houses with reference to the meridian assures the sun in fair measure to all.

Area in Streets, Parks, etc.

The following table shows the area in acres in streets, parks, and building lands and the percentage in each of the total area:

	Area in Acres	Per Cent of Total
Streets	45.7	26.6
Parks	29.2	17.0
Building land	97.1	56.4

The width and lengths of the proposed streets, exclusive of the streets at the boundary, are as follows:

80 feet wide	4,800 feet
86 feet wide	15,230 feet
60 feet wide	2,330 feet
50 feet wide	10,300 feet

In all developments of this character the planning must be for *community* needs and not simply for the work and recreation of separate unorganized individuals. As Emerson said:

"If the artist will study with hope and love the precise thing to be done by him, considering the climate, the soil, the length of the day, the wants of the people, the habit and form of the government, he will create that in which all these will find themselves fitted, and taste and sentiment will be satisfied also."

An Effective Shade Tree Development Plan for a Small City

Creating a Municipal Shade Tree Interest That Is Permanent and Community-wide in Its Effect

By George A. Adsit

Park Commissioner, Cortland, N. Y.

DURING the early development of the average American community, shade trees were given little consideration by the city administration. Most of the older trees were planted by individual property owners without any general scheme, each person planting what and where he wished. The result was a hodgepodge arrangement of trees of various types and kinds, in many cases suitable and in many unsuited to the conditions in which they were planted. As very little care was given these trees, many towns and cities began to discover that they had trees which were affected with diseases and insect pests—so badly in some cases as to necessitate the removal of these trees and the planting of new ones to take their places.

With the increasing realization of the value of shade trees, both for their beauty and their health-giving qualities, many successful attempts have been made to work out a systematic program of planting and supervision. In some cases the cities have taken the entire responsibility for the selection, planting and care of the trees. In other cases the cities have tried to regulate responsibility for shade trees by ordinances, leaving the actual carrying out of the work up to the property owners themselves. In still other places the cities have assumed the expense and supervision of tree planting, and have enlisted the aid of the property owners and others in carrying out this plan.

The first plan has the fault that, where the city assumes the entire responsibility, citizens themselves lose an active interest in their shade trees and take them for granted, as they do their water system, sewer system and the like. The second scheme has the disadvantage that the lack of cooperation from the city is apt to result either in ordinances remaining dormant or in their being brought to light only through some infringement. The third plan has the advantage of being one which not only gets results for the city from its actual work, but enlists the cooperation of the citizens in following up this work and creates at the same time a civic interest which aids other public activities. This third plan is especially adapted to the smaller or moderate-sized cities.

What Happened in Cortland

As a result of a destructive wind-storm which visited the city of Cortland, N. Y., destroying some 1,200 or 1,500 of its old shade trees, the value of these trees as an asset was brought forcibly to the attention of the city and a prompt plan of replacement and protection became imperative.

Previous to the storm, the city of Cortland was in the condition of many other Eastern cities, in that it had many beautiful shade trees, but some two-thirds of them were old trees which through neglect were rapidly falling prey to insect pests and diseases.

In laying out the plan, three features were considered: (1) the temporary restoration of the trees only slightly injured and the correction, in so far as possible, of the conditions which were causing the decline of the old or matured trees; (2) the planting of young trees of suitable size and variety to replace the destroyed trees and those trees which were past any permanent value as shade trees, and the additional planting of young trees to keep up with the city's growth; and (3) a systematic scheme of supervision and care of the young and newly planted trees, so as to provide for their healthy growth and development.

The Plan

The plan as worked out by the city was an educational campaign with the object in view of presenting the facts to the citizens and creating a general active interest in the city tree problem. This was to be followed up with a planting campaign supervised by the city and actually carried out by the citizens; and following this was to come a systematic follow-up plan by the city to correct and care for these trees. During the entire program the idea was to create the impression that the trees, whether on public or on private property, were a part of the holdings of individuals,

TYPICAL SCENE OF DESTRUCTION WROUGHT BY WIND-STORM ON STREET TREES
Homer Avenue, Cortland, N. Y.

in which they should take the same degree of interest that they would in looking after the care of their roofs and the painting of their houses.

A City Park Commissioner was appointed by the Board of Public Works. The Common Council consented to act with him, and the program was inaugurated by a proclamation from the Mayor. This set forth the facts in the case and the object of the campaign, which was to culminate in an Arbor Day program for tree planting. The Landscape Department of the State College of Forestry was consulted and experts laid out a plan for selection and planting of trees of such size and variety as were best suited to the local climatic and soil conditions. A general newspaper campaign was carried out by means of news items and advertisements. Publicity was given the work through talks before all local organizations, schools and, in many cases, churches. The campaign was aided by a letter mailed to each landowner of the city, giving in detail the object of the project and bespeaking his interest and individual support. With this letter was enclosed a pamphlet giving a description of the trees advised as best adapted to Cortland's plan, with a short description and instructions for selecting and placing for different streets.

Selection and Purchase of Trees

In order to facilitate the handling of the trees and to insure good stock, the city assumed the responsibility for the purchase, transportation and delivery. The trees were purchased through the State College of Forestry and were bought subject to supervision and inspection, upon arrival, by the College's experts. The trees were re-sold to the citizens for planting at the original cost price of the tree at the nursery, the city standing the expense connected with the publicity, transportation and delivery. When the first letter was sent out to the landowners, price list, order blank and return envelope were enclosed, so that persons wishing trees could, by filling out, signing and returning the order blanks, procure trees delivered at their doors in time for Tree Planting Week. In a preliminary circular sent out to the citizens describing the trees which were to be distributed during the campaign, attention was called to the desirability of keeping to the type of trees already on the street, when selecting any new trees for planting. Later on dur-

CAR-LOAD OF TREES BEING UNLOADED ONTO CORTLAND BOARD OF PUBLIC WORKS TRUCK FOR CITY PLANTERS
The trees are being inspected by representatives of the New York College of Forestry and the City Park Commission

TREES PLANTED ON PUBLIC PROPERTY IN PORTLAND WERE WATERED PERIODICALLY BY THE CITY FIRE DEPARTMENT

ing the publicity work, through the newspapers and other channels, a suggestion was made that citizens living in any certain block or on any street should, if any question was in their minds, get together and select the variety they wished to have planted in that section. They were also advised that, by getting in touch with the City Park Commissioner's office, they could get suggestions, advice, and spacing for any section or street. In a great many cases, this plan worked out, and committees from the street calling on their neighbors along the street could get complete cooperation. As a last precaution, when orders were brought in and grouped for shipping instructions, they were looked over, and if it was found that a poor selection had been made, the person ordering was diplomatically advised to that effect and a suggestion for changing was made. This in every case worked out without trouble and with surprisingly little detail work for the results obtained. The delivery was taken care of by the Board of Public Works of the city, which unloaded the trees from the cars upon their arrival, packed them in straw upon trucks, wet them down and distributed them. In order to simplify distribution the orders were sorted at the City Clerk's office into sections and each section listed together. When the city's order was forwarded to the nursery, the nursery was instructed to label each tree with the name and address of the person to whom it was to be eventually delivered and to tie each individual's complete order together. All the orders for a certain section of the city were packed in a single car or section of the car.

During the interval between the closing of the order campaign and the arrival of the trees for planting, follow-up work was done to teach people how to plant and care for the trees upon their arrival and to interest them further in planting. Persons who wished to order trees from other sources or to get them wild from the surrounding country were encouraged to do so, and were given instructions in planting and care. Upon the date of the arrival of the cars of trees, each person who had placed an order was mailed a pamphlet and letter, the letter calling attention to the fact that the trees would be delivered the next day and should be given proper care on arrival; also that collections would be made at time of delivery. In case the person ordering the trees was not at home, the order was left packed in straw, wet down in the shade, and a letter was mailed calling attention to the fact and asking that remittance be made immediately to the City Clerk's office.

Aid from Local Organizations

Organizations, women's clubs, school children and other local groups were encouraged to plant trees. As a result, a memorial planting scheme was worked out by the American Legion in cooperation with the women's clubs of the city in which a good-sized tree was planted in honor of each man or woman whose life was given in service during the World War.

Schools were especially encouraged to take part in the city Arbor Day program, and in order to increase school interest each senior in the two city high schools was presented with a 2-inch tree by the Common Council, with the understanding that this tree was to be planted at some place designated by the Park Commissioner where it would be of public benefit, as part of the student's contribution to the city's welfare. The places selected included ward school grounds, Children's Home grounds and public parks. The supervision of this planting was taken over by the Cortland Rotary Club, which made a special feature of the day by entertaining the seniors as their guests at a Country Club luncheon and proceeded from there to the planting. Each Rotarian took the responsibility for the actual planting of the tree belonging to some one of the young lady seniors. In this way a great deal of general interest was aroused and the planting was practically completed in the one afternoon, so that all that was necessary was an inspection the next day to see that all the trees had been properly planted.

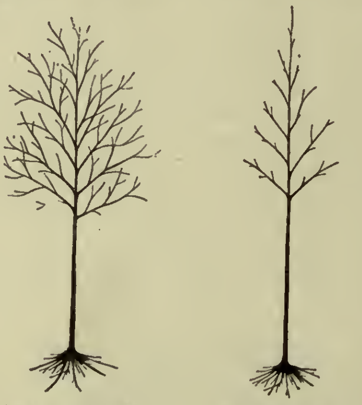
The problem of watering and caring for these trees on public grounds during the first few weeks was handled satisfactorily by the local Fire Department, whose members voluntarily assumed this responsibility. This they did by using buckets and fire-hose from nearby hydrants on which reducers were put and garden hose attached.

Follow-up Work

The tree-planting campaign was followed up by a group of men headed by an expert who systematically covered the city, examining, pruning and treating the trees. Wherever a tree needed attention, the property owner was consulted, instructions as to what was necessary were given, and his interest and cooperation solicited. Older trees which were on the decline were treated where feasible, pruning and open tree surgery being the treatment given; the idea being that the average citizen would not be receptive to too expensive treatment and that a proper amount of open surgery would take care of the tree satisfactorily at reasonable cost. In the case, however, of any well-to-do individual who desired attention on some particular trees in which he had great interest, he was advised to give such trees the very best of surgical attention.

DIRECTIONS FOR PRUNING DECIDUOUS TREES

Most young trees, as received from the nurseries, have a good shape and contain many small branches in the crown. However, in order not to put too great a tax upon the roots during the first season of growth, the trees should be heavily pruned. In general branches containing from one third to one half of the leaf buds should be removed. A tree that is compact in growth and has many branches should be pruned by removing whole branches and tipping back slightly the branches which are left rather than by uniformly cutting back all of the branches. Care should be exercised in the process that the general shape of the tree is not injured. Most of the pruning can be done more easily before the tree is planted, but the work may be done immediately after planting if necessary. Wherever branches are cut off the cut should be made as close to the trunk as possible, so that no suggestion of a stub will remain. Further, all wounds made in pruning should be painted, also any breaks or injuries to the bark. A comparison of the accompanying cuts will give an idea of how to prune a normal tree at time of planting.



The tree as it arrived from the nursery.

The same tree correctly pruned and ready for planting.

The roots are often broken and damaged in transportation, and in all such cases, the roots should be cut off clean with a sloping cut above the break or crack. If the roots are very long they may be cut back slightly. However, it is not advisable to reduce the length or bulk of the roots except in case of injury or necessity.

From a pamphlet mailed to the citizens of Cortland, at the time of notice that delivery of trees would be made next day

This work was carried on during the entire summer season and a program, modified to fit the changing conditions, was planned for each year following, so that in time not only would the trees be in good condition but the general public would come to realize the value of the trees and have a working knowledge of their care.

As a result of Tree Planting Week not only were there planted in Cortland enough trees of good size and shape to more than replace the 1,200 or 1,500 trees destroyed by the storm of the previous season, but the interest spread among various organizations in the city and throughout the county. The Cortland County Sportsmen Association alone put out some 23,500 small seedlings of black walnut and evergreen trees for stream protection and game covers. These were planted in some cases on private property and in others on public lands, a great many of the trees being planted by the rural school children. The Cortland County Farm Bureau planted some 11,000 small trees, these being distributed in thousand lots to farmers who desired them for farm woodlot planting. The city Water Board put out a number of trees in connection with the development of the 120 or 130 acres of land in the city water reservation. All in all, the city of Cortland together with the county planted a total of approximately 35,000 trees during Tree Planting Week. This means an equivalent of one and one-fourth trees planted to each person in the entire county—a record which it is believed has hardly been duplicated elsewhere, especially as all these trees were planted, not for commercial gain, but solely for their beneficial results from other standpoints.

Practically all these trees have come through the winter in excellent shape, and the interest this spring in following up their care has been very active. The citizens have acquired a very beneficial general knowledge of their shade tree and park development as a result of this work.

For a general discussion of "Shade Trees and City Forestry" and a list of books, pamphlets and articles in The American City, relating to these subjects, see the 1924 *Municipal Index*, pages 94-95.

Random Comments on Town-Planning Tendencies in Massachusetts

By William Roger Greeley

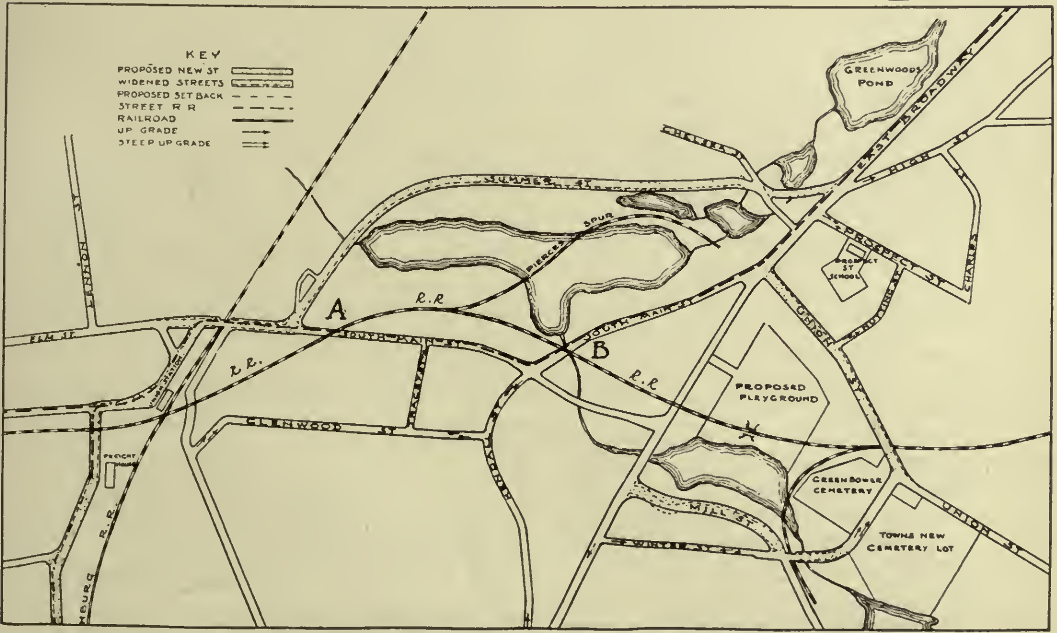
Architect and Town Planner

THERE has been a law in Massachusetts throughout this century requiring the progressive abolition of grade crossings. During the first years of its operation many such crossings were abolished, with far-reaching benefits to the localities involved. Recently money has been lacking to carry out the law, and so the good work has languished. This unhappy condition results from the impecuniosity of the railroads. Many a city or town has waited in vain for the time to come when the railroad companies would resume their grade-crossing program. The wisest have seen the hopelessness of such delay and have taken the problem up from the other end—the abolishing of some of the grade crossings, at comparatively small expense, by more scientific planning of the highways.

The highway often crosses and recrosses the railroad tracks. Just as two minuses make a plus, two crossings may be converted to none at all. In the city of Gardner, Mass., it is planned to eliminate for through traffic two dangerous and extremely annoying grade crossings, with scarcely any new road construction, simply by rerouting over an existing highway.

A large percentage of existing grade crossings are unnecessary crossings, grade or otherwise. When this becomes more fully realized, a great amount of danger for the public can be promptly eliminated, with a reciprocal benefit to the railroads; for every grade crossing is a grave financial burden upon the corporation that pays for its maintenance.

At present the situation is, in its broad aspects, simply this: The public pays the railroads for the unnecessary expense of maintaining crossings upon which, every year, a certain number of said public must be killed. The railroad cannot afford to build bridges, and the towns or cities are almost equally without available funds for such costly operations. The railroad right of way cannot be



A SECTION OF THE TOWN OF GARDNER, MASS.

East Broadway, South Main and Elm Streets form the chief thoroughfare and are part of the Mohawk Trail. By constructing a short connection between East Broadway and Chelsea Street, practically extending the length of High Street, and by widening Summer Street on one side a complete new thoroughfare is secured at trifling expense, and two grade crossings, A and B, are avoided diverted. Therefore, the only remaining way out is to change the line of the public highway so as to avoid the railroads. The plan shown herewith is a typical instance.

Setbacks

The rapid growth of automobile traffic in recent years has focused attention upon the width of thoroughfares and also upon the dangers connected with hidden corners. The necessity of widening existing highways, especially in our cities, has brought us face to face with the enormous cost of condemning buildings along the lines of such thoroughfares.

These considerations have caused many communities to take up actively the establishing of building lines, or setbacks, on important streets. The town of Brookline has already established several miles of such building lines at a very trifling cost to the town. The result will be out of all proportion to the expense of securing these setbacks. The town of Winchester has pursued the same policy. Lexington has already tried out a method of securing a setback through a petition of abuttors along Massachusetts Avenue near the center of the town, and signatures to such a petition have been obtained from every property owner on both sides of the street.

The value to any given property holder of protecting himself against possible injury through the construction on neighboring property of a new building set directly up to the line of the sidewalk is of more consequence than the theoretical loss to himself of the privilege of building up to his own line. At least, this is the way that it seems to work out very often in actual practice. Where buildings have already been erected adjacent to the street line, there is no immediate damage to such property, as the restricting is not retroactive, but applies only to reconstruction or new buildings. The advantage in the future of a wider street, with consequent freer transportation, is ample compensation in the case of lots of ordinary dimensions, for the loss of the narrow front strip of line. The net result is not a loss of front line, but virtually the loss of the narrow strip at the rear of the lot and the location of the lot upon a broader and better street. A copy of the above-mentioned petition follows:

To the Selectmen and Board of Survey, Lexington, Mass.:

Subject to the conditions named below, the undersigned owners of property bordering on North Hancock Street respectfully petition your honorable Board to establish, as provided by law, a building line upon each side of said street as follows, namely, beginning at the easterly end of said North Hancock Street at its junction with Hancock and Burlington Streets and extending to the westerly end of said street at its junction with Bedford Street, a southerly building line to be 25 feet in and distant from the southerly exterior line of said street, and beginning at the said easterly end of North Hancock Street and extending to the westerly end at said junction with Bedford Street, a northerly building line to be 25 feet in and distant from the northerly exterior line of said North Hancock Street; and we hereby mutually agree and covenant with each other and with the town represented by you, to execute any agreements, conveyances or releases necessary to establish the said building line as appurtenant to our respective premises, it being understood, however, that said agreement and covenant are made upon and subject to the following conditions:

(1) Said agreement and covenant shall not apply to existing buildings or structures, but only to new structures and to additions to or extensions of existing structures.

(2) Said agreement shall not be binding upon the undersigned unless and until at least 75 per cent of all sole owners or property abutting on said street shall have signed like agreements.

Street Corners

In connection with working out a zoning plan, there is a tendency to provide small business zones at the intersection of important thoroughfares. This is logical, but needs to be handled carefully. Stores built up at such intersections often require a delivery wagon backed up to the sidewalk curb in front, and such wagons very seriously cut down the traffic passing through the intersection of the streets. It seems advisable to provide parking space somewhere outside the line of the traveled way in cases of this kind. Certain types of business have already realized this and have voluntarily set their buildings back to provide for such parking space. Gasoline stations have almost universally followed this policy.

The town of Lexington is now proposing to work out such a scheme in connection with its zone plan.

Natural Features

With the increase in size of our cities, many existing features, both natural and historical, are swept away unless some agency looks ahead and safeguards these features. This is proper work for the planning board. The popular judgment in regard to historic monuments and natural features has undergone a complete change. Formerly quite indifferent, to-day the people are thoroughly appreciative of parks and scenic beauty in their communities and, as a rule, have learned to value their historic monuments. Many beauties of nature have passed forever, but those that are left may well command the attention of the planning board. Whatever the board can do to save or to create such beauty will be most highly appreciated by the better citizenship of to-day and by future generations.

Control of Real Estate Development

One of the most serious threats to the well-being of a community is unscrupulous real estate development. Many attempts have been made to prevent the unwise subdivision of land by private enterprise. So far nothing has proved wholly successful. If the board of survey refuses to accept as a public street rights of way laid out on private property, nevertheless after houses have been built upon these streets the popular clamor results in the final acceptance of the street, especially as the public health will have demanded the introduction of water-mains and other public utilties in order to prevent a serious health menace to the whole community. Many ways have been tried of warning prospective purchasers against difficulties to be encountered where land developments are not being laid out with the approval of authorities representing the citizens of the community. These efforts are not wholly successful, as the purchasers are often the victims of very clever misrepresentation and just as often are unable to discriminate between good and bad advice.

The town of Melrose proposes not to allow any permit to issue for a new building in an unaccepted street until the permit and the circumstances connected with it have been reviewed by the planning board. This is an interesting and wholesome provision. It gives the planning board an opportunity to consult the prospective builder and to give him any warning which it deems justifiable, to save future difficulties.

How Shall We Separate Walkers and Riders?

ONE of the most serious of traffic problems is presented by conflicts between automobiles and pedestrians. There was a time, not a quarter of a century ago, when the pedestrian could mingle with the slow-moving vehicles in the roadway with comparative safety. That time has passed, though the common law still gives him the legal right to use any part of the street. The law must be changed to meet new conditions. It must be made as illegal for pedestrians to enter the roadway at will as it now is for automobiles to enter the sidewalk area.

The present trend indicates that we shall go farther in the separation of walkers and riders. No matter how congested the traffic, automobiles are not normally driven on the sidewalks. This is not the fault of the drivers, but is due to the fact that automobiles are so constructed that it is difficult for them to climb the curb. Pedestrians, on the other hand, are not so handicapped. They enter the roadway at will. During the past summer I counted jaywalkers in Cleveland, Chicago and Los Angeles, and found that the average was more than 1,000 per block per hour on the busy shopping streets. This intermingling in the roadway of pedestrians and automobiles retards traffic, and is one of the chief causes of accidents.

Barriers should be erected which will make it as difficult for pedestrians to enter the roadway at mid-block as it now is for automobiles to climb the curb. I predict that the next decade will show many of the trunk highways of the country, and many of the major express streets of our cities, as well protected against casual pedestrians as are some of our great railways at the present time. It may even be that the separation of vehicles and pedestrians will go so far that it will not be necessary for those on foot to enter the roadway at any place. In Chicago, there is a subway which carries pedestrians under Michigan Avenue, while in San Francisco the pedestrian bridge has been used with success. The protected safety zone and crosswalk are, of course, merely other manifestations of the same tendency. Every city can at least afford the liberal use of paint to mark out the street areas which are for the special use of pedestrians.

How far we shall go in throwing physical guards about our traffic machine it is difficult to tell. Growing unrest is bringing about many radical proposals. Some cities are contemplating the building of speed checkers in the streets in the form of raised obstructions or depressions. There is a widespread feeling that sooner or later the law will require that every vehicle be equipped with an automatic speed governor, and that the heavier types of vehicles at least will be required to carry safety fenders.

—From an address by Miller McClintock, of the Bureau of Municipal Research, Harvard University, at the recent Massachusetts Safety Conference.

More Than Four Hundred Women Hold Municipal Office in Wisconsin

ON January 1, 1924, according to a recent report of the Municipal Information Bureau of the University of Wisconsin, there were over 400 women holding municipal office in Wisconsin. Replies to the Bureau's questionnaire were received from 100 cities and 194 villages. If the remaining 37 cities and 159 incorporated villages in the state had replied, the number of women office holders reported would doubtless have been considerably larger.

The cities reported 1 woman mayor, 8 alderwomen including a councilwoman under the city manager plan, 5 city clerks, 9 city treasurers, 1 auditor, 2 justices of the peace, 1 supervisor, 12 policewomen, 100 members of school boards, 89 menbers of library boards, 11 members of health boards, 19 members of park boards, 11 members of cemetery boards, 2 members of police and fire commissions, 1 member of the hospital board, and 1 poor commissioner.

In the villages reporting there were 12 members of village boards of trustees, 14 village clerks, 28 village treasurers, 2 assessors, 1 supervisor, 4 justices of the peace, 20 members of the school board, 23 members of the health board, 18 members of the library board, 2 members of the police and fire commission, and 3 members of the park board.

White Joint Filler for Concrete Roads

Two Years' Trial Shows New Material Has Decided Value

By L. G. Carmick

Chemist, U. S. Bureau of Public Roads

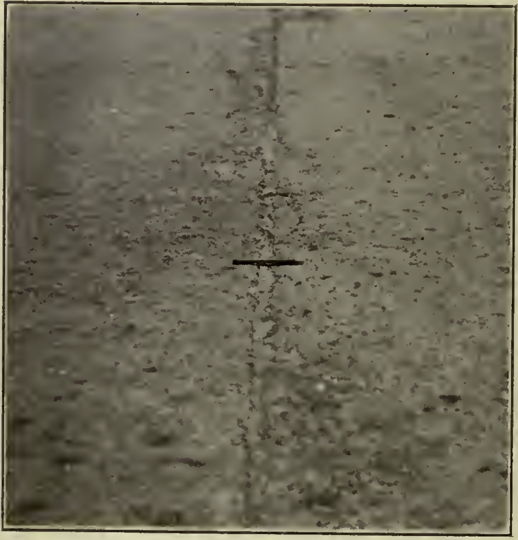
TWO years' trial of a light-colored material developed by the Bureau of Public Roads for use as a filler for joints and cracks in concrete roads has demonstrated that the material has qualities which make it decidedly valuable for the purpose. Considering the lasting qualities of the material, it has also been demonstrated that it is certainly not much more costly than other fillers, and it is possible that it will be found to be no more expensive.

In the early part of 1922 the Bureau of Public Roads began a search for some material of about the same color as portland cement concrete that could be used for filling cracks and expansion joints in concrete roads. The bituminous materials which have always been used for this purpose are considered fairly satisfactory in most respects, but they unquestionably disfigure the road. A large number of different substances were experimented with and abandoned, which it is not worth while to mention here. However, after numerous failures a plastic material was found which seems to have most of the desired qualities.

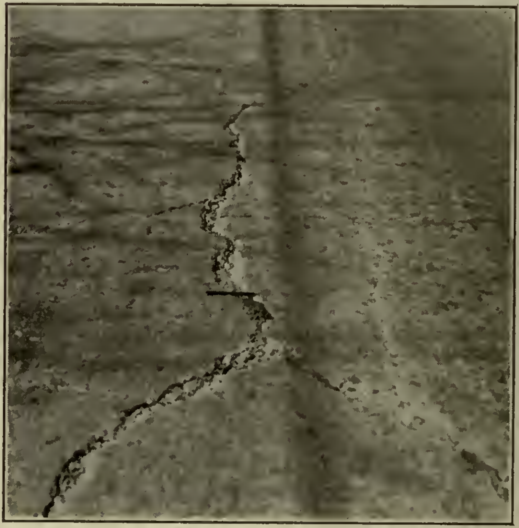
Character of the Material

It is an intimate mixture of crude unvulcanized rubber with rosin in the proportion of one part of rubber to about ten of rosin, to which mixture is added a considerable quantity of a neutral white pigment, preferably barytes or titanox. Some difficulty was experienced at first in securing a homogeneous mixture of these materials, as rubber does not dissolve readily in melted rosin. But, eventually it was found that if the rubber were softened by allowing it to absorb about twice its weight of a light petroleum lubricating oil, and the mixture effected in a steam-jacketed iron vessel provided with revolving arms which exerted a mixing and kneading action, a smooth product could be obtained. This material differs in many respects from tar and asphalt. In color it is almost white, but it can be readily tinted to any desired shade. It is extremely sticky, especially when hot, and has a high degree of ductility. In these respects it resembles bituminous materials, but it is far less affected by temperature changes. It is more difficult to melt and even in the coldest winter weather met with in the vicinity of Washington it does not become brittle.

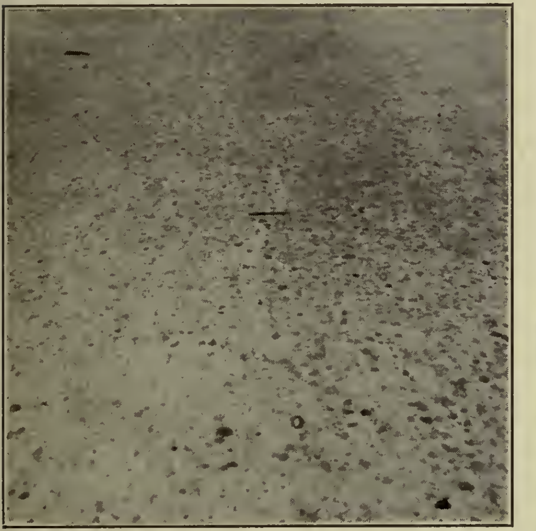
To use this material successfully these facts must be borne in mind. It may be melted in open kettles at the roadside, but the melting takes longer than with bitumens and care should be taken to prevent the material from



THE LIGHT-COLORED MATERIAL FILLS THE JOINTS WELL, DOES NOT BLEED, AND HAS OUTLASTED TWO FILLINGS WITH ASPHALT



THE CRACKS FILLED WITH ASPHALT HAVE BEEN REFILLED ONCE AND ARE NOW BADLY IN NEED OF FURTHER ATTENTION catching fire and to avoid overheating. At a temperature of about 110° to 125° C. it is fluid enough to pour, and it does not become much more fluid even though the temperature be considerably raised, but the quality of the material is injuriously affected if heated much above this temperature. It was also found that it did not flow to the bottom of the cracks as readily as bituminous fillers, but this was overcome by the use of a hot iron implement, with which it can be worked down into even very narrow cracks. The tool used at present somewhat resembles a laundry iron, but with a handle long enough to enable a man to use it without stooping uncomfortably. Two of these are necessary, one being heated while the other is in use. As soon as the material is poured into the crack it is gone over with the hot iron and in this way very good results are obtained.



THE NEW MATERIAL IS INCONSPICUOUS AND IN SOME CASES ALMOST INVISIBLE

Behavior and Cost of Filler

This crack filler has been used experimentally in several of the states, and the reports have been generally favorable. It has also been used in the Columbia Pike, an experimental road constructed by the Bureau of Public Roads near Washington. Frequent inspections of the material as used in this road, and comparison with the several types of bituminous fillers also used, provide the basis for the statements made in this article. On the Columbia Pike the cracks were filled with the new material in December, 1922. A recent inspection shows them to be in good condition still. The cracks are well filled and the material has shown no tendency to flow out or "bleed." Traffic has done it no harm. The cracks that were filled after the men had learned how to handle the material are particularly good. They are inconspicuous and, in some cases, almost invisible. Cracks that were filled at the same time with asphalt had to be filled again in September, 1923, and are now badly in need of further attention. The asphalt flows out, causing an unsightly black streak in many cases several inches wide on each side of the crack.

This light-colored crack filler costs at present about 10 cents per pound, which is, of course, much more than asphalt or tar, and, furthermore, it is not likely that its cost can be very greatly reduced. Also, the labor cost of applying it is somewhat more than for asphalt, and it was accepted as a fact in the beginning that it could not compete in price with bituminous fillers. Its use was felt justified, however, because in any case it would be a very small item in the cost of a first-class concrete highway, and the finer appearance of the road, due to the absence of black streaks, was considered to be worth the additional cost.

THE ASPHALT FILLER HAS FLOWED OUT OF THESE JOINTS, FORMING UNSIGHTLY BLANK STREAKS SEVERAL INCHES WIDE

However, in view of recent inspections it seems that its cost, taken over a period of years, may not be so much greater than that of asphalt after all. For instance, cost data on the road mentioned show that filling cracks with asphalt cost $0.0075 per square yard of road for labor and material. The cost of the light-colored filler was about 1 cent per square yard for material and 1¼ cent for labor, the total being about three times as much as for asphalt. It is, therefore, apparent that if the light-colored material lasts three times as long as asphalt, it will entail no greater expense. Experience so far seems to indicate that this will be the case.

Acknowledgment.—Reprinted from *Public Roads*, published by the Bureau of Public Roads, U. S. Department of Agriculture.

What Is the Best Pavement?

By William J. Dougherty

Secretary-Engineer, Park Commission, Portland, Maine

IF you are an engineer engaged in the designing and construction of street pavements and highway surfaces; if you are a contractor engaged in building roads or pavements; or if you are prominently identified in your section or community in the street-paving work or the highway construction of your state, you will doubtless be asked this question many times; the number depending on the extent to which you come into contact with the public. If you are in the category of those qualified to discuss roads and pavements intelligently, you will have a mental irritation at the question, and you will be divided in mind between the wisdom of making a lot of technical comparisons of the types or of admitting frankly and briefly, for your own convenience, that you do not know.

A Helpful Expression of Opinion

This article was not originally intended for publication, but was just the recorded thoughts of the author on one occasion when he was asked that embarrassing question, frequently put to city officials by earnest taxpayers, "What is the best type of pavement?" Solving this problem is the same as tackling a problem in mathematics when there is one unknown quantity too many. It is only by the careful consideration of each factor as outlined by the author that any reasonably satisfactory and intelligible answer can be prepared.

And how very many times this meaningless question is put forth! People in general, of course, do not stop to think that "best" is the superlative of good, and that comparisons of pavements or highway surfaces must be made on common bases. The comparison is usually grounded on the amount and character of the vehicular traffic to be accommodated.

With this as a basis, the attempt is then made to determine as best you can the most economical paved surface to prescribe to meet the present and the estimated requirements of the traffic called for, and it is not a brief matter to discuss the relative economy of several types of surfaces which may be proposed for a street or highway.

Of several good types of surfaces which may be admitted, the type carrying the low first-cost will have a strong appeal, but it is the ultimate low cost which should be uppermost in our minds. And in the final low cost we find involved the durability of the pavement and the interest factor over the "economical life" of the structure, or, in other words, over that period of years during which it is cheaper to maintain than to reconstruct. It is evident that we have some indeterminate factors, and with the ever-increasing motor vehicle production we are apt to have more.

Important it is, also, that we should have in mind the "resistance to traffic" which is offered by the types under consideration, for herein lies a true economy of transportation costs, which should not be undervalued.

Other factors which may appear minor, but which should have a place in the comparison under certain conditions, are: the general favorableness to travel, or the esthetic value of the type; the ease with which cleaning may be accomplished, if in the case of a street pavement; or even the degree of slipperiness of the surface if we are still to consider the horse in this motor age.

So it is pretty much by a process of eliminating the types which are weak in the important points of comparison that an intelligent selection of a pavement should be made.

It is only by deductions similar to the foregoing that we can rightly arrive at the answer to the bothersome question, which is the best pavement? And, how many taxpayers would really be entertained by such a discourse?

[Editorial Note.—For a tabulation of types of paving in American cities of more than 10,000 population, see the 1924 *Municipal Index*, pages 215-218.]

Specifications for Cast Iron Pipe

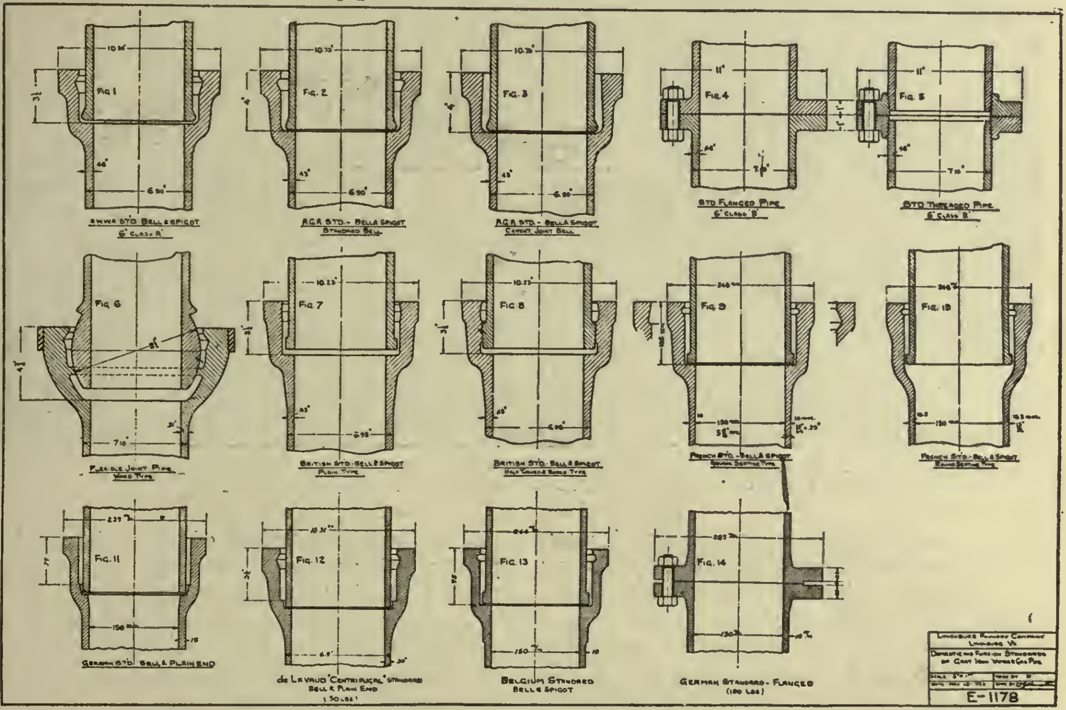
AT a conference held under the auspices of the American Engineering Standards Committee in New York early in June, it was decided that there should be undertaken a general program of unifying existing specifications for cast iron pipe into a consistent set of nationally recognized specifications covering both gas and water pipe. Consideration of the subject was introduced in a comprehensive paper by W. G. Hammerstrom, which outlined the present practice, not only of various organizations which have issued formal specifications, such as the American Water Works Association, The American Gas Association, and the American Society for Testing Materials, but indicated the more usual commercial departures from, and extensions of, these standards. Mr. Hammerstrom also outlined the foreign practice, with particular reference to the work of the British, French and German cast iron pipe industries.

After a very thorough discussion of the various problems concerned in the proposal to bring about national uniformity in the industry, agreement was reached on a general program for the work. This program covered unification and development of specifications for cast iron pipe, including materials; dimensions; pressure ratings; methods of manufacture, including such new developments as centrifugal casting, in so far as new specifications may be necessary to secure satisfactory results; elimination of unnecessary sizes and varieties; consideration of the possibility of developing a coordinated scheme of metallic pipe and fittings applicable to all common mediums, possibly along the lines of the work being carried on in Europe on the same subject; and methods of making up joints, in so far as they are the determining factors as to the dimensional design of cast iron pipe.

The types of cast iron pipe under standardization are to include:

1. Flanged pipe
2. Flanged and bell mouth fittings and wall castings
3. Pipe elbows, tees, Y's, return bends, and other fittings not now included in standard lists
4. Cast iron pipe threaded for flanges or couplings
5. Soil pipe and other light types of cast iron pipe and fittings

The standardization will be coordinated with that of the existing sectional committee



DOMESTIC AND FOREIGN STANDARDS OF CAST IRON WATER AND GAS PIPES on pipe flanges and fittings, which is already well advanced under the sponsorship of the American Society of Mechanical Engineers, the Manufacturers Standardization Society of the Valve and Fittings Industry, and the Heating and Piping Contractors' National Association. It was recommended that the work be carried out by a sectional committee under the auspices and procedure of the American Engineering Standards Committee, and under the joint sponsorship of the American Gas Association, the American Water Works Association, and the American Society for Testing Materials, and that formal recommendations to this effect be made to the American Engineering Standards Committee. At its meeting on June 12, the American Engineering Standards Committee formally ratified the recommendations and designated the three organizations named as joint sponsors for the work.

New Street-Lighting System Increases Real Estate Values

Louisville, Ky., Extends Installation to Suburbs

THAT the cost of installing an ornamental street-lighting system in Louisville, Ky., has been more than paid for by the great increase in real estate values in the short time since the installation was made, has been affirmed by G. M. Miller, Superintendent of Distribution of the Louisville Gas & Electric Company, who had general charge of the installation. The installation was completed October 25 and since then the real estate values have increased 25 per cent. Moreover, in Cherokee Village, a new subdivision of Louisville just opened, when it was learned that a lighting system like that of Louisville was to be installed, every lot sold in a few days.

The installation in Louisville consists of 112 30-foot tubular steel poles with ornamental cast iron bases, manufactured by the Electric Railway Equipment Company. Each pole is equipped with a Westinghouse municipal trolley bracket on which is mounted a Westinghouse octagonal Reflecto-Lux top with a 600-candle-power lamp. These tops are of old colonial style and are composed of eight separate glass panels which can easily be replaced at a cost of a few cents a panel. The tubular steel poles take the place of unsightly wooden poles which are being removed. The cost of making this installation was $35,000.

NIGHT SCENE LOOKING EAST ON BROADWAY, LOUISVILLE, KY., SHOWING DOUBLE UNITS ON LEFT SIDE OF BROADWAY AND SINGLE UNITS ON RIGHT SIDE

The installation in the new Cherokee Village consists of 21 posts each equipped with 400-candle-power, 15-ampere lamps. All of the service in the village, including telephone and electric lines, will be underground.

The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

A City's Liability for Acts of Its Officers and Employees

GENERALLY, an employer's liability to a third person for injury inflicted by an employee is tested by the fact as to whether or not the injury was inflicted in the course of the employment. To some extent this principle governs the liability of cities as employers of persons whose wrongful acts cause damage to others, although municipalities have broad exemption from responsibility on account of the exercise of governmental functions.

Below we present some abstracts from court decisions, culled at random but serving to define the limits of municipal responsibility under this head.

In the case of Fowler vs. City of Cleveland, 126 Northeastern Reporter, 131, the Ohio Supreme Court said:

> "It is not the policy of the government to indemnify persons for loss, either from lack of proper laws or administrative provisions, or from inadequate enforcement of laws or the inefficient administration of provisions which have been made for the protection of persons and property. The unwisdom and impracticability of such a system are easily apparent. But we hold that where a wrongful act which has caused injury was performed by the servants of a municipality, in the performance of a purely ministerial act which was the proximate cause of the injury, without fault on the part of the injured person, the municipality is liable, and the fact that it derives no pecuniary profit from the thing done does not change the rule."

The decision reached by the Court in the cited case, that a city is liable for injury to a pedestrian caused by careless driving of a fire truck by a member of the municipal fire department, is at variance with conclusions reached by the courts of most of the other states in similar cases. "The overwhelming weight of authority is to the effect that a fire department, maintained by a municipal corporation, belongs to the public or governmental branch of the municipality so as to relieve it, at least in the absence of statutory provision to the contrary, from liability for injuries to person or property resulting from malfeasance or nonfeasance connected with the maintenance thereof." (9 American Law Reports, 143.)

A city is not liable for negligence of a street-sprinkling employee, as where one dropped a hydrant plug cover in such way that a child was injured, held the highest court of the land in the case of Harris vs. District of Columbia, 41 Supreme Court Reporter, 610. The Court observed:

> "When sweeping the streets, a municipality is exercising its discretionary powers to protect public health and comfort, and is not performing a special corporate or municipal duty to keep them in repair."

The decisions of the state courts are at variance on the question whether cities are liable for negligent acts of an employee in sprinkling or cleaning the streets, or collecting garbage. The different views are expressed in 14 American Law Reports, 1473-1480.

Perhaps no more comprehensive or concise summary of the decisions on the general subject of municipal responsibility has been made than that stated by a standard legal authority as follows:

> "To determine whether there is municipal responsibility, the inquiry must be whether the particular officer, board, or department whose misfeasance or nonfeasance is complained of is a part of the machinery for carrying on the municipal government; whether it was at the time engaged in the discharge of a duty or charged with the performance of a duty primarily resting upon the municipality, and if so, such officer, board, or department acts as the agent of the municipality; or whether the agents or servants for whose acts or negligence it is sought to hold the corporation are its agents and servants for the performance of a public duty imposed by law, or merely for the carrying out of private functions which are for its special benefit or advantage." 28 Cyc. 1269.

Not long ago it was decided by the Massachusetts Supreme Judicial Court that a town in that commonwealth was not liable for malicious prosecution of abuse of civil process by its officers and employees as a means of expelling persons from the town (Broen vs. Town of Edgartown, 128 Northeastern Reporter, 1.) The Court said:

"In this commonwealth a town in its corporate capacity will not be bound, by express vote or by subsequent ratification, to the performance of contracts or to answer in damages for the torts [wrongs] of its servants and agents where the acts and duties were in their nature unlawful or prohibited, or were wholly beyond the powers of the town as not coming within the scope of the objects and purposes for which it was incorporated."

In the case of Gold vs. Mayor and City Council of Baltimore, 112 Atlantic Reporter, 588, the Court of Appeals for Maryland held that a municipality, in operating public schools, performs a governmental function, and is not liable for negligent acts of its employees in performing that duty. That was a case where a pupil was injured through the fall of a door which negligently had been permitted to get out of order.

The handling of persons sick with contagious diseases is a duty which the city performs, through its officers and agents, in the exercise of governmental functions. The benefits of such service go to the public, and not to the municipality as a corporate body. Hence the manner in which the officers of the city perform that service cannot, ordinarily, render the municipality liable in damages. It was so decided by the Washington Supreme Court in the case of Lynch vs. North Yakima, 80 Pacific Reporter, 79. The Court held that defendant city was not liable for smallpox contracted by a fireman who was exposed to it through negligence of a police officer in bringing a smallpox patient into quarters set apart for firemen and there fumigating him.

The last cited opinion is in line with the earlier holding of the Michigan Supreme Court (88 Northwestern Reporter, 695) that the city of Detroit was not liable for employing men in dismantling a building which had been used as a smallpox hospital, without first adopting disinfecting measures.

It has been frequently declared by the courts that one dealing or contracting with city officials and employees is bound to take notice of limitations upon their authority. One may not blindly assume that such an official or employee has all the authority that he purports to exercise. A case in point is McLean vs. Mayor and Common Council of Newark, 110 Atlantic Reporter, 692, in which the New Jersey Supreme Court decided that defendant city was not liable for materials and labor furnished on orders of the chairman of the public building committee of the City Council, the orders not having been authorized by the city, nor by the committee of which he was chairman, and the Council not having ratified the orders or any like orders.

Sundry Items of Municipal Law

Municipal Liability as to Sewers and Drains

A municipality acts ministerially, and is responsible for actual damages caused by the negligent manner in which it discharges its duty in constructing and maintaining sewers to control water falling or flowing on its streets, according to the holding of the Alabama Court of Appeals in the case of Kircus vs. City of Birmingham (99 Southern Reporter, 780).

City Held to Have Right to Temporarily Segregate Parts of Public Streets for Use of School Children

The right of a city to temporarily segregate parts of public streets for the use of school children was upheld by the Arkansas Supreme Court in the recent case of Owens vs. Town of Atkins, 259 Southwestern Reporter, 396. Plaintiffs unsuccessfully challenged the right of the Council of defendant town to permit the local school board to rope off a part of a street for use in conducting ball games. The Supreme Court said:

"The Town Council and the School Board joined in the commendable effort to furnish the youth of Atkins the wholesome sport so essential to their physical development, and also to afford them and the people of the town an innocent diversion, which added greatly to their pleasure and entertainment, by providing a park where the great American game of baseball could be played. This, under the circumstances, was a use temporary and reasonable in character, which tended to promote the welfare of the town, and which the Town Council was fully justified in recognizing."

Community Building May Be Built at Public Expense

A community building may be built by a town at public expense, as a "public purpose" for which taxes validly may be levied, held the Illinois Supreme Court in the late case of Robbins vs. Kadyk, 143 Northeastern Reporter, 863. The Court said of an act the validity of which was under review:

"The act in question authorizes the construction of the community building for the free use and benefit of the inhabitants of the town, for lectures, concerts, free amusements and entertainments, and all other general educational purposes. The annual town meetings and other public assemblies may be held therein. The providing a place for the annual town meeting is a public purpose. The holding of political meetings and assemblies of people for other purposes and the discussion of public questions may be properly regarded as public purposes germane to the object of government."

Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources

For further information, Mr. Williams may be addressed in care of
The American City Magazine, 443 Fourth Avenue, New York

Recent Zoning Ordinances and Laws

Boston, Mass.—Special act, June 5, 1924

Melrose, Mass.—Ordinance passed by town February 5, 1924

Swampscott, Mass.—Ordinance adopted

Winchester, Mass.—Ordinance passed by town, and approved by Attorney General March 25, in force April 11, 1924

Minneapolis, Minn.—Ordinance, April 7, 1924

Omaha, Nebr.—Ordinance March, 1924

Columbia, S. C.—Ordinance, May 29, 1924

Recent Zoning Decisions

Maryland.—Goldman v. Crowther, Building Inspector of Baltimore. The Court of Appeals has filed an order directing reargument in the case involving the validity of the zoning ordinance of Baltimore City. The reargument will be heard during the October term. The Court directs that counsel in their addresses shall include, but not be restricted to show, the following questions:

1. The amount of discretion which by Section 22-F of the zoning ordinance is vested in the Board of Zoning Appeals, when, as the ordinance says, "there are practical difficulties or unnecessary hardships in the way of carrying out the letter of this ordinance and the maps." Is there anything in the restriction imposed by the ordinance which is final and beyond the discretion of the Board of Appeals?
2. Would that section permit discrimination between uses of the same general description but with differences in condition under which the work is carried on in one place and in another? Or must all similar uses be treated indistinguishably in a class in the same district?
3. Is or is not the power given by the ordinance to the Board of Zoning Appeals too arbitrary and unlimited to be constitutional?
4. On the provision for appeals to the Baltimore City Court—can the municipal corporation without legislative authority, confer a new special jurisdiction upon a state court and define its procedure, as this ordinance undertakes to do?
5. If the provision for appeal to the Baltimore City Court should not be valid, what if any effect would its validity have on the validity of the remainder? Is such an appeal necessary to the ordinance?

New York.—People ex rel. Frax Realty Co., Inc., v. Kleinert, Supreme Court, Special Term, Part I, Kings County, reported in *New York Law Journal* July 10, 1924, p. 1316. A home for the aged is not a hospital within the meaning of section 20 of the Building Zone Resolution of New York City forbidding the erection of a garage for more than five cars within 200 feet of any hospital maintained as a charitable institution. The case cites and reviews numerous cases with regard to the meaning of the word hospital in such connections.

New York.—People ex rel. Multiplex Garages, Inc. v. Walsh; People ex rel. Ashley v. Same; Supreme Court, Bronx County, reported in *New York Law Journal* June 28, 1924. Certiorari to review action of Board of Appeals. Permit had been issued for and there had been erected a large number of one-car garages on a parcel of land, in one ownership, in a district designated as a "business" district under the New York City Zoning Resolution. The garages are and are intended to be leased out separately, and it is not asserted that they are operated otherwise than individually. The basis of the action of the Board of Appeals revoking the permits for the buildings is that the erection of the garages in a business district is prohibited by Article II, par. 4, subdv. 15 of the Building Zone Resolution of New York City, to the effect that in a business district "no building or premises shall be used and no building shall be erected which is arranged, intended or designed to be used" for a "garage for more than five motor vehicles." However desirable it might be to restrict as to number the erection on a single lot or on a parcel of land owned by a single person, of one-car garages in a business district, the fact is that there is no such restriction either in the ordinances or in the statutes. The power given the Board of Appeals to relieve or relax does not give it the right to declare to be illegal a use which was previously legal and which has not been made illegal by, or pursuant to, statute.

New York.—Village of Larchmont v. Town of Mamaroneck, 208 App. Div. 812. (Memorandum judgment without opinion.) The village of Larchmont, within the town of Mamaroneck, sought to erect on property belonging to it, and located within the town, and outside the village, a building for the storage of material to be used in connection with the village water-works. The lot in question was within a district zoned by the town as residential. *Held* that the town be enjoined from interfering with the construction of any building on the premises, held by the village for public use, designed and erected for the purpose of carrying that public use into execution.

Ohio.—Kuhn Bros. v. City of Youngstown, Ohio Bulletin and Reporter, June 16, 1924, 25 Ohio Nisi Prius Reports, N.S., p. 31. The provision in the Youngstown zoning ordinance forbidding the erection of apartment houses in a given district, is a valid exercise of the police power. The Court in its opinion discusses the question fully and cites and reviews the authorities at length.

Ohio.—Santangelo v. City of Cincinnati, Superior Court of Cincinnati, June 18, 1924. In this case the Court upholds the constitutionality of a provision in the zoning ordinance forbidding the erection of stores in residential districts.

Ohio.—Appeal of White from Decision of Board of Appeals under Zoning Ordinance of City of Pittsburgh. Court of Common Pleas, Allegheny County, April Term, 1924. The Pittsburgh zoning ordinance provides that in the first area districts, in one of which the property in question is situated, "when the front wall of eighty per cent of all the buildings on one side

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of a street between two intersecting streets has been kept back from the street line, no building hereafter erected or altered shall be placed nearer to the street line than the distance established by the majority of the eighty per cent at the time of the passage of the ordinance." The appellants were enclosing an open porch projecting beyond the line. *Held* that such action was a violation of the provision of the ordinance, and the provision was reasonable and valid.

Recent Zoning Literature

James Ernest King, who so often before has written interestingly and well on city planning topics, has contributed an article to the *Boston Evening Transcript* of June 28, 1924, entitled "Zoning Sweeps Whole Metropolitan District." The article is a careful review of the progress of zoning in the various parts of the region in and around Boston.

Irving Stewart of the University of Texas has written an article for the *National Municipal Review* of June, 1924, on "Zoning and the Courts in Texas." His review of the Texas cases on the subject leads him to the conclusion that "nothing short of a constitutional amendment will permit zoning to be carried on in Texas; and in the light of the state's experience with proposed constitutional amendments one granting zoning powers to cities would have little chance of adoption." This is not the opinion of Edward M. Bassett and other students of zoning, who believe that nothing in the decisions in Texas precludes the state from authorizing its cities by a proper enabling act to adopt zoning ordinances.

Conference on Nutley Case

On June 20, 1924, a conference was held at the City Hall, Newark, under the auspices of the New Jersey State League of Municipalities, to discuss the effect of the Nutley case, so often referred to heretofore in these columns, and to decide upon the proper course of action under the circumstances. There were present Frank H. Sommer, who represented the New Jersey State Chamber of Commerce in the Nutley Appeal; Edward M. Bassett, counsel of the Zoning Committee of New York, Herbert S. Swan, who has zoned many New Jersey cities; representatives of New Jersey cities and civic organizations and others. As a result of the discussion the conference adopted the following resolution:

Resolved, that it is the sense of this meeting:

(1) That the recent decision of the court of last resort of this state in the Nutley case should not deter municipalities contemplating the adoption of zoning ordinances from proceeding with their enactment.

(2) That all existing ordinances should forthwith be amended to conform their terms to the provisions of the standard act adopted by the Legislature of this state at its last session.

(3) That all zoning ordinances hereafter adopted, and all ordinances in amendment of existing zoning ordinances hereafter enacted, should emphasize the phases of the police power of the state in exercise of which such ordinance is adopted, and the conditions which, in the general welfare in the judgment of the governing body, demand the adoption of such ordinance.

(4) That all municipalities proceed without delay to set up the Board of Adjustment provided for in the new act and to define its powers with precision.

(5) That all municipalities interested in zoning continue in association together actively and aggressively to secure general recognition of the value, and judicial recognition of the constitutionality, of the zoning principle.

(6) That the municipalities continue the enforcement of their existing zoning ordinances in order that advantage may be obtained through judicial construction of the various features of the act under which such ordinances were adopted as a guide to future action.

(7) That to that end the present Zoning Committee of the League be and is hereby continued as the Executive Committee of the municipalities interested in zoning.

(8) That through such Committee, and acting under its guidance and advice, the associated municipalities unite for the defense of any action which in the judgment of such committee may retard the full recognition and sanction of the zoning principle in that state in order that the burden of bearing the burden of litigation which is common interest shall not fall wholly upon the municipality in which such action may originate.

The Municipal Bond Market

By Sanders Shanks, Jr.

Editor, *The Bond Buyer*

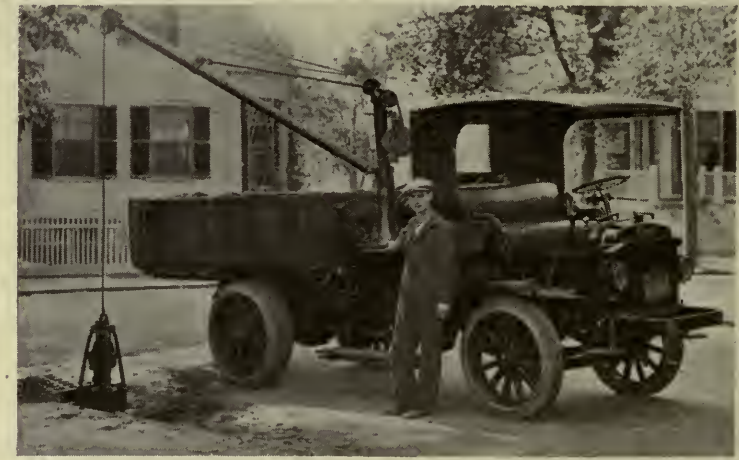
THERE has been a marked reduction since July 1 in the volume of new financing on the part of states and municipalities. The first six months of the year was a record-breaking period in that respect, over $800,000,000 worth of new bond issues having been floated. With the seasonal dullness featuring the investment markets, it is fortunate that new loans are not coming on the market at the pace of earlier in the year. As it is, a good balance between supply and demand seems likely to obtain until investment activity is resumed after Labor Day. If a much-reduced supply of new bonds is then still the rule, the market should be in a strong position, and even higher prices than those current might well be looked for.

The advance in market values since the year started is perhaps not fully appreciated. Assuming that the typical municipal improvement bond issue runs for 20 years and would have sold seven months ago at 100 cents on the dollar with the coupon rate at 4½ per cent, it may be stated that the same bond would command to-day about 104. Expressed differently, this means that a loan costing a 4½ per cent net interest rate last January could now be negotiated on a net 4.20 per cent interest basis. Figure out the saving on a $100,000 bond issue, and this reduced interest charge represents a big item to the thousands of communities with their tremendous aggregate of loans.

The following list of important loans floated in July will illustrate the advanced price level for state and municipal loans established in recent weeks:

Municipality or State	Amount	Coupon Rate (%)	Maturity	Net Int. Rate (%)
State of Delaware....	$500,000	4	1964	4.05
State of Michigan..	3,000,000	4 & 4¼	1944	4.10
Albany, N. Y.......	2,010,000	4 & 4¼	1924-44	3.99
Bridgeport, Conn. ..	450,000	4¼	1925-54	4.00
Buncombe Co., N. C.	300,000	4¾	1929-39	4.72
Chicago. Ill.	5,000,000	4	1925-45	4.21
Essex Co., N. J....	1,450,000	4½	1925-74	4.17
Johnstown, Pa.	425,000	4¼	1939	4.18
Greenwich, Conn. ..	400,000	4¼	1929	3.96
Los Angeles Co., Calif.	5,000,000	5	1925-44	4.78
Marion Co., Ind...	800,000	4½	1925-40	4.12
Norfolk, Va.	3,000,000	4½ & 5	1934-51	4.64
Philadelphia, Pa.	5,000,000	4¼	1925-1944	4.12
Toledo, O.	350,000	4¾	1929	4.40

City of Cambridge reduces cost of cleaning Catch Basins with 4-cylinder Autocars



4-cylinder, 2- to 3-ton Autocar owned by the City of Cambridge, Mass.

The City of Cambridge, Mass., is saving time and money and its employees' health with a 4-cylinder, 2- to 3-ton Autocar equipped with a Healy catch basin cleaner, a special apparatus for cleaning out catch basins without going down into the manhole.

The equipment is guaranteed by its maker to clean out all sizes and makes of catch basins, regardless of what is in them. Mud, waste paper, rags, baby carriage wheels, discarded automobile tires—everything comes out, without breaking the Board of Health regulation forbidding city employees to go down into catch basins.

And the 4-cylinder Autocar does its part of the work in an equally efficient manner. The engine, through the Autocar power take-off, supplies the power for operating the bucket, and also for the pump used in draining off the water. With this 4-cylinder Autocar the City of Cambridge has reduced the cost of cleaning catch basins to a small percentage of what it was formerly.

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Municipal and Civic Publications

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Hygiene and Public Health.—By George M. Price, M. D., Director, Joint Board of Sanitary Control; Director, Union Health Center, New York City. Lea & Febiger, Philadelphia. 1924. Third edition, thoroughly revised. VIII + 306 pp. $2.25.

The essential parts of the vast subject are covered briefly, omitting any discussion of personal hygiene. This latest edition includes new chapters on the hygiene of childhood and on food. The topical presentation and the questions at the end of the chapters adapt the book for classroom use. The chapter divisions are: Housing Hygiene; Child Hygiene; School Hygiene; Industrial Hygiene; Public Water-Supply; Foods; Meat Foods; Milk Supply; Disposal of Waste Matter; Public Nuisances; The Prevention of Infectious Diseases; Federal Hygiene.

Sewage Disposal in the Valley of the Merrimack River.—Special Report of the Massachusetts State Department of Public Health Relative to the Matter of Sewerage and Sewage Disposal in the Valley of the Merrimack River. Senate Document No. 492. April, 1924. 60 pp. Maps, tables. Reporting upon a general system of sewerage and sewage disposal to prevent the pollution of the river, and affecting the cities of Lowell, Lawrence, Haverhill and Newburyport and the towns of Dracut, Tyngsborough, Chelmsford, Billerica, Tewksbury, Andover, North Andover, Methuen, Groveland, West Newbury, Merrimac, Amesbury, and Salisbury. (Apply to X. H. Goodnough, Chief Engineer, State Department of Health, State House, Boston, Mass.)

Municipal and School Playgrounds and Their Management.—By J. F. Rogers, Chief of Division of Physical Education and School Hygiene, U. S. Bureau of Education. School Health Studies No. 6, of the Bureau. January, 1924. 22 pp. Tables. An analysis and a summary of the answers to a questionnaire sent out to all superintendents of schools in cities having a population of 30,000 or more. (Apply to the Government Printing Office, Washington, D. C.)

The Fiscal Administration of City School Systems.—A report reviewed and presented by the Educational Finance Inquiry Commission under the auspices of the American Council on Education, Washington, D. C. The report was prepared for the Commission by J. R. McGaughy, Special Investigator for the Headquarters Staff. Published by The Macmillan Company, 64 Fifth Avenue, New York, N. Y. 1924. XII + 95 pp. Diagrams, tables. Supplementing a chapter of the General Volume, "The Financing of Education in the State of New York," by the Educational Finance Inquiry. This study describes significant differences in fiscal practices in city school systems, classifying these systems on the basis of relative independence from municipal authorities, and developing a valuable statistical technique. (Apply to the publishers.)

Minneapolis Finance.—Budget Facts and Financial Statistics of the City of Minneapolis for 1924. Issued by the Board of Estimate and Taxation, City Hall. 28 pp. Charts, tables. The chief purpose of this publication is to present facts pertaining to the costs of the city government, about which inquiries are frequently made, in such a manner that the information will be readily available. (Apply to George M. Link, Secretary of the Board.)

County and Country Life Problems.—The County as an Administrative Unit in Social Work, by Howard E. Jensen. 8 quarto pp. in the May, 1924, issue of The Journal of Social Forces. Discussing, and illustrating by actual examples, the advantages of the county unit in this work. The county is "the one nation-wide unit of local self-government in America." "The county has advantages in area and population. The state is too large, the local community too small." Private agencies have already developed county programs in the rural field. (Apply to The University of North Carolina Press, Chapel Hill, N. C.)

The LaSalle Street Improvement, Chicago.—"How the LaSalle Street Improvement Affects You." Issued by the Chicago Plan Commission, Hotel Sherman. Chicago, Ill. 31 pp. Addressed to the property owners affected by the widening of the street, and giving arguments to show that of two ways of making the improvement, one will increase the value of the property twice as much as the other will. (Apply to the Commission.)

The Policewoman—Her Service and Ideals.—By Mary E. Hamilton. Frederick A. Stokes Company, New York. 1924. XV + 200 pp. $1.50.

It is only during the last ten years that the use of policewomen has developed. There is still a lack of standardization in the organization of the work, and this book represents an effort on the part of New York City's first policewoman to summarize the essentials of training and service. Protection and crime prevention are the watchwords for policewomen, whose task is quite different from that of the men on the force. The policewoman's work is with children, girls and women, and her research is revealing the sources and causes of crime and its remedies. This earnest, illuminating volume presents high ideals based on wide experience and understanding. Its illustrative incidents point the principles set forth in the analysis of this important field of woman's service.

Automobile Green Book.—Vols. 1 and 2, 1924. Scarborough Motor Guide Company, Indianapolis, Ind., and Boston, Mass. 827 and 921 pp. Maps. $3.00 each.

Volume 1 is the official guide book of the Automobile Legal Association, 6 Beacon St., Boston, and covers the New England States and trunk lines west and south; Volume 2 is the official touring guide of the New York State Automobile Association and covers New York, New Jersey, Pennsylvania, Delaware, District of Columbia, Central Canada, and Florida, with trunk lines to New England and the West. Full information for motorists over these routes.

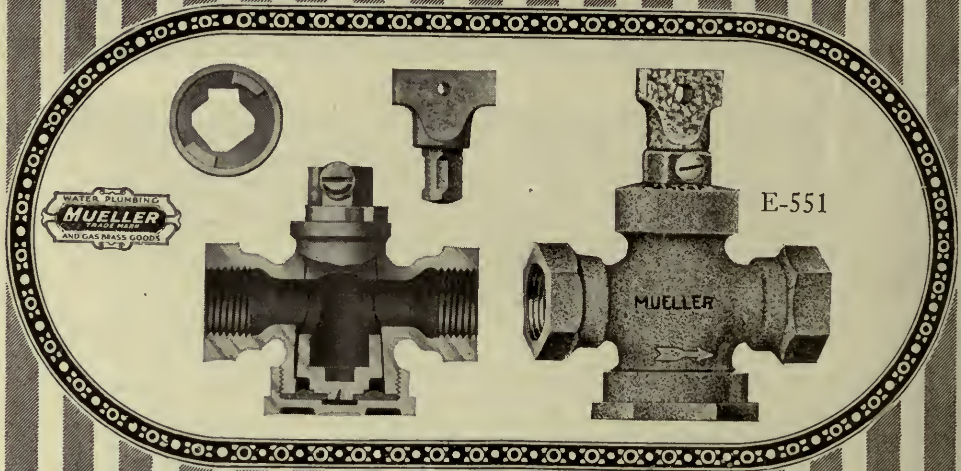
Competency and Economy in Public Expenditures.—Edited by Clyde L. King, Secretary of the Commonwealth of Pennsylvania. The May, 1924, issue of The Annals of the American Academy of Political and Social Science. XI + 366 pp. 48 papers by authorities, presented under the following large divisions: The Trend in Public Expenditures; The Opportunities of the Budget; Fiscal Control and Competency in the Public Service; Self-Support in Public Institutions; The Relation of the Machinery of Government to Competency in Public Management; Equal Pay for Equal Work Among Public Employes; Competency and Economy in Purchasing; Morale and Ability in Public Service. (Apply to The American Academy of Political and Social Science, 39th Street and Woodland Avenue, Philadelphia, Pa.)

California's Highways.—Transactions of the Commonwealth Club of California, March, 1924. 101 pp. The Section of State Highways of the Commonwealth Club of California was re-established in 1922 under the chairmanship of Charles D. Marx, Professor of Civil Engineering at Stanford University, to consider the way in which the the state highway program was being carried out. The material presented at the two meetings of the section in 1923 has been condensed and rearranged, and appears in this issue of the Transactions. (Apply to E. A. Walcott, Executive Secretary of the Club, San Francisco, Calif.)

Symposium on Public Health Training.—In the June, 1924. issue of The American Journal of Public Health, 370 Seventh Avenue, New York, N. Y. Authoritative articles on training for the general and special fields of public health activity, as well as training in special subjects for sanitarians in general. (Apply to the Journal.)

What Our City Councils Are Doing.—Brief list of references to ordinances introduced in or passed by the city councils of large cities from March 3, 1923, to January 15, 1924. List No. 6, Feb. 1, 1924. Prepared by the Bureau of Statistics and Municipal Reference Library, 1005 City Hall, Chicago, Ill. (Apply to Frederick Rex, Municipal Reference Librarian.)

Why and How to Teach Civic Effectiveness.—As illustrated by school participation in the Community Better Homes Campaign. By Elizabeth Carlisle, Head of Civics Department, Washington Junior High School, Port Huron, Mich. Foreword by James Ford. Executive Director, Better Homes in America. Publication No. 2, March, 1924. Issued by Better Homes in America. 16 pp. 5 cents. (Apply to the publishers, 1653 Pennsylvania Avenue, Washington, D. C.)



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145-149 W. 30th St., New York; 1072-76 Howard St., San Francisco; 2468 Hunter St., Los Angeles

Community Chests.—Three pamphlets prepared by Harvey Leebron: A Model Community Chest Constitution, 16 pp; The Financial Federation Movement, 100 pp.—a fact-finding investigation of community chest developments, methods and results in 150 American cities; Billy Welfare's Travelogue Through Seventeen Gates of the City of Havaheart, 24 pp. (Apply to Harvey Leebron, Executive Director, Community Welfare League, Holyoke, Mass.)

A Standard of Community Excellence.—The Kind of a Town We Would Like to Live In. By John Ihlder, Manager, Civic Development Department, Chamber of Commerce of the United States. An address delivered before the Seventeenth Annual Convention of the Southern Commercial Secretaries' Association, at Spartanburg, S. C., June 12, 1924. 14 pp. Sixteen items on which to estimate the excellence of a town. (Apply to the author, Washington, D. C.)

Aquafax.—Volume 1, Number 1 (June, 1924), of a magazine published monthly by the Neptune Meter Company for the purpose of disseminating accurate information regarding the utilization and conservation of the country's greatest natural resource—water. 54 quarto pp. Many attractive illustrations of water-supply sources. Several articles showing the importance of securing and maintaining adequate water-supplies, and describing special projects for this purpose. Planned to be country-wide in its scope and "direct and everyday" in its language. $3 a year; 35 cents a copy. (Apply to the publishers, Gay & Water Streets, Baltimore, Md., or 50 East 42nd St., New York, N. Y.)

A Comprehensive City Plan, Memphis, Tenn.—A full and detailed presentation of what has been done to plan and carry out a program of physical improvements in Memphis. 176 quarto pp., with many views, drawings, maps, and diagrams. A very attractive and interesting report, covering all the phases of planning for a future growth of fifty years. (Apply to Harland Bartholomew, City Plan Engineer, Compton Building, St. Louis, Mo.)

Chicago, Ill.—Annual Report of the Municipal Reference Library for 1923. (Apply to Frederick Rex, Municipal Reference Librarian, 1005 City Hall.)

Cincinnati, Ohio.—Annual Reports of the Department of Street, Sewer, and Catch-Basin Cleaning for 1922 and 1923. (Apply to Fred Maag, Superintendent, Street Cleaning Department.)

Easton, Pa.—Thirty-seventh Annual Report of the City, for 1923. (Apply to W. M. Heiberger, Mayor.)

Jamestown, N. Y.—Annual Message of the Mayor, May 26, 1924. (Apply to Samuel A. Carlson, Mayor.)

Richmond, Va.—Fifth Annual Report of the Department of Public Utilities, for 1923. (Apply to E. W. Trafford, Director.)

Rochester, N. Y.—Annual Report of the Department of Charities, for 1923. (Apply to Mrs. Jennie Couchman, Commissioner of Charities.)

On the Calendar of Conventions

AUGUST 7.—SARATOGA SPRINGS, N. Y.
American Association for the Promotion of Hygiene and Public Baths. Annual meeting. Rec. Secretary, Hildegarde M. Rosen, 140 West 98th Street, New York, N. Y.

AUGUST 12-15.—QUEBEC, QUE.
Dominion Association of Fire Chiefs. Annual convention. Secretary, Chief James Armstrong, Fire Department, Kingston, Ont.

AUGUST 15-22.—SALT LAKE CITY, UTAH
American Prison Association. Annual congress. General Secretary, E. R. Cass, 135 East 15th Street, New York, N. Y.

AUGUST 19-21.—MASON CITY, IOWA
League of Iowa Municipalities. Annual meeting. Secretary, Frank G. Pierce, Marshalltown, Iowa.

AUGUST 19-22.—BUFFALO, N. Y.
International Association of Fire Engineers. Annual convention. Secretary, James J. Mulcahey, City Hall, Yonkers, N. Y.

AUGUST 21-23.—SEATTLE, WASH.
Washington Association of Commercial Organization Secretaries. Annual convention. Secretary, F. W. Mathias, Commercial Club, Hoquiam, Wash.

AUGUST 23-24.—MONCTON, N. B.
Union of New Brunswick Municipalities. Annual convention. Secretary, James King Kelley, 108 Prince William Street, St. John, N. B.

AUGUST 27-29.—TORONTO, ONT.
Ontario Municipal Association. Annual convention. Secretary, Horace L. Brittain, 189 Church Street, Toronto.

SEPTEMBER 2-4.—SHARON, PA.
League of Cities of the Third Class in Pennsylvania. Annual convention. Secretary, Fred H. Gates, City Clerk, Wilkes-Barre, Pa.

SEPTEMBER 9-11.—READING, PA.
Pennsylvania State Association of County Commissioners. Annual convention. Secretary, L. C. Norris, Clearfield, Pa.

SEPTEMBER 10-12.—MONTREAL, QUE.
Canadian Tax Conference. Canadian Civil Service Conference. Annual convention. Secretary, Horace L. Brittain, 189 Church Street, Toronto, Ont.

SEPTEMBER 15-18.—TOPEKA, KANS.
Southwest Water Works Association. Annual convention. Secretary, R. D. Morgan, Mexia, Tex.

SEPTEMBER 23-25.—MONTREAL, QUE.
City Managers' Association. Annual convention. Executive Secretary, John G. Stutz, Lawrence, Kans.

SEPTEMBER 29-OCTOBER 2.—BOSTON, MASS.
American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, P. O. Box 332, Lakeland, Fla.

SEPTEMBER 29-OCTOBER 3.—LOUISVILLE, KY.
National Safety Council. National Safety Congress. Secretary, W. H. Cameron, 168 North Michigan Avenue, Chicago, Ill.

SEPTEMBER 30-OCTOBER 3.—ROCHESTER, N. Y.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

OCTOBER 6-9.—WASHINGTON, D. C.
American Institute of Park Executives. Annual convention. Secretary-Treasurer, Will O. Doolittle, Box 548, Minot, N. Dak.

OCTOBER 6-9.—WASHINGTON, D. C.
American Red Cross. Annual convention. Secretary, Mabel T. Boardman, National Headquarters, Washington, D. C.

OCTOBER 6-10.—MONTEREY, CALIF.
League of California Municipalities. Annual convention. Executive Secretary, William J. Locke, Pacific Building, San Francisco, Calif.

OCTOBER 8-10.—WASHINGTON, D. C.
American Civic Association. Annual convention. Secretary, Miss Harlean James, Union Trust Building, Washington, D. C.

OCTOBER 8-10.—EMPORIA, KANS.
League of Kansas Municipalities. Annual convention. Secretary-Treasurer, John G. Stutz, Lawrence, Kans.

WEEK BEGINNING OCTOBER 13.—PASADENA, CALIF.
American Institute of Electrical Engineers. Pacific Coast Convention. Secretary, F. L. Hutchinson, 33 West 39th Street, New York, N. Y.

OCTOBER 14-16.—KANSAS CITY, MO.
American Child Health Association. Second annual meeting. Secretary, Dr. Philip Van Ingen, 370 7th Avenue, New York, N. Y.

OCTOBER 14-17.—AUGUSTA, GA.
International Association of Municipal Electricians. Annual convention. Secretary, W. R. Arbuckle, Bayonne, N. J.

OCTOBER 16-17.—COLUMBUS, OHIO
Ohio State Conference on City Planning. Annual conference. Secretary-Treasurer, Charlotte Rumbold, 201 Chamber of Commerce Building, Cleveland, Ohio.

OCTOBER 16-21.—ATLANTIC CITY, N. J.
Playground and Recreation Association of America. Annual Recreation Congress. Secretary, H. S. Braucher, 315 Fourth Avenue, New York, N. Y.

OCTOBER 20-22.—WASHINGTON, D. C.
National Association of Commercial Organization Secretaries. Annual meeting. Secretary-Treasurer, Raymond B. Gibbs, Chamber of Commerce, Kansas City, Kans.

OCTOBER 20-23.—DETROIT, MICH.
American Public Health Association. Annual meeting. Secretary, Homer N. Calver, 370 Seventh Avenue, N. Y.

NOVEMBER 4-7.—HOUSTON, TEXAS
Texas Association of Sanitarians. Meeting—Annual Short School for Sanitarians, in cooperation with the Texas State Board of Health. Secretary, E. G. Eggert, Texas State Board of Health, Austin, Tex.

NOVEMBER 10-12.—HARVARD UNIVERSITY, CAMBRIDGE, MASS.
National Municipal League. Annual meeting. Secretary, H. W. Dodds, 261 Broadway, New York, N. Y.

The Dixie Highway, north of Toledo, O. Tarvia-built 1910.

This 1910 car has chugged its last chug —this 1910 Tarvia Road is still good

IMAGINE the car pictured here snorting up to your door tonight. Yet that car was modern when the Tarvia pavement was laid on the Dixie Highway—back in 1910.

Those old-time cars have gone their way. But the Tarvia pavement of this heavily traveled section of the Dixie Highway, after fourteen years of ceaseless motor traffic, is as good as the day it was laid.

Only the most economical maintenance is necessary to make a Tarvia pavement last indefinitely. And these facts in addition: A Tarvia pavement will not wave, roll or rut. A Tarvia pavement is skid-proof, because of its granular surface.

Thousands of Tarvia streets and roads have proved to taxpayers that for the money spent Tarvia gives more mileage and the most years of satisfactory paving service.

On request, we will gladly send you descriptive booklets, construction data and specifications.

Tarvia

For Road Construction Repair and Maintenance

The Barrett Company

New York
St. Louis
Detroit
Minneapolis
Youngstown
Baltimore
Chicago
Cleveland
Kansas City
Salt Lake City
Milwaukee
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News and Illustrations

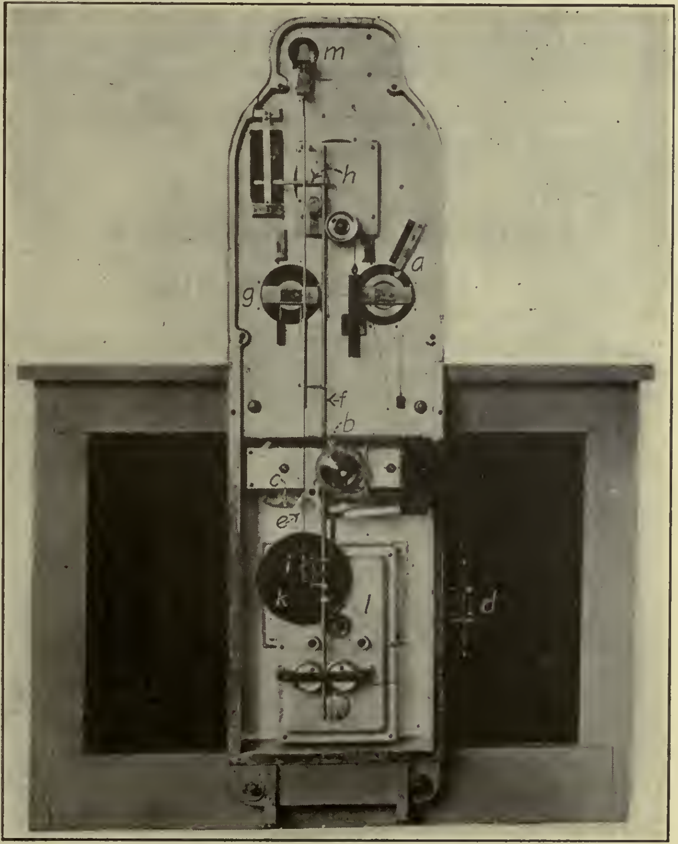
Items of Interest to City, Town and County Officials, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

New Venturi Effluent Controllers at Detroit

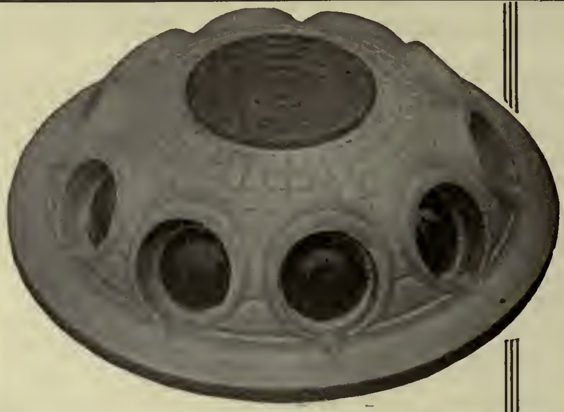
By Ed S. Smith, Jr., and Charles G. Richardson

A NOVEL feature of the Venturi effluent controllers recently installed in the new rapid sand filters at Detroit is an integrating counter, registering the total output of each filter in gallons. The counter is a part of the controller gage on each operating table and is in addition to the customary indicating dial and recording chart for showing the rate of flow, and the indicating dial for the loss of head. This design permits careful analyses of the performance of the filters to be made readily; an unusually important consideration where there are eighty filters in operation.

The gage mounted upon the operating table is actuated by two mercury float wells which are set on the pipe gallery floor and connected to the water on the filter and to the Venturi controller tube in the effluent line. A small cable connects the float in the loss-of-head well to a counterweighted pulley which is attached to the loss-of-head indicator hand and also to an electrical switch "a" for the globe-light alarm on the operating table. This light notifies the operator as soon as the loss of head for the filter has reached its permissible maximum. Another small cable connects the float in the other mercury well to a counterweighted pulley on the rate-of-flow side of the gage. An adjustable cam "b" driven by the segmental gear "c," which is mounted upon the pulley shaft, operates a small pilot valve "d" for the hydraulic piston, which in turn operates the main control valve in the Venturi controller tube in the effluent line. This design permits the control rate to be set manually at will at the controller table instead of in the pipe gallery beneath. A fixed cam "e" upon the pilot-valve cam-shaft moves a vertical counterbalanced rod "f" between ball-bearing guide rollers a distance proportional to the rate of flow. The indicator dial hand "g" and the recording pen "h" are both operated by this rod, and consequently equally spaced graduations are used for both the rate-of-flow dial and the chart. For the counter, a small traction-driven wheel "i" attached to the lower part of this rod is moved radially from the center to the periphery of a rubber-faced disc "k," which is driven at a constant rate by a pendulum clock movement "l"; at high rates of flow this small wheel is near the top edge of the disc and turns rapidly; at low rates it is closer to the center and turns more slowly. Hence the movement of the traction wheel is directly proportional to the total flow, and its movement is transmitted ingeniously through a light square metallic vertical shaft and ball-bearings to the upper counter dial "m."



REAR VIEW OF OPERATING GAGE WITH COVER REMOVED



This is a Life Insurance Policy---

Does YOUR City Hold One?

THE LEHMAN TRAFFIC GUIDE

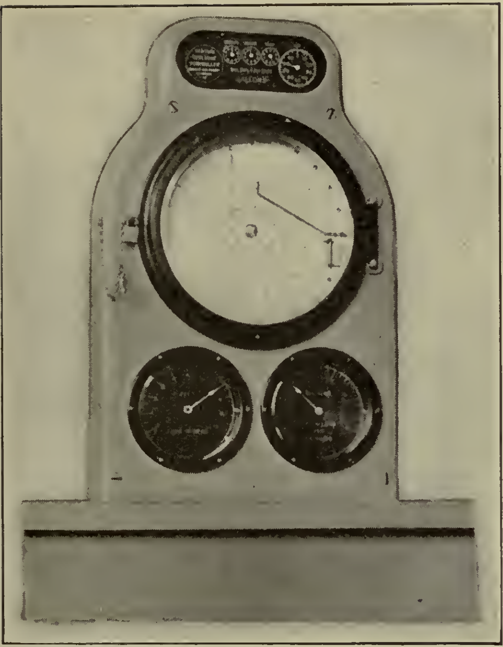
may be called a life insurance policy for the protection of the public. The City (policy holder) purchases the Guide to insure its citizens (beneficiary) of absolute safety, thereby eliminating worry and preserving life by preventing traffic accidents.

To City Officials—It is your duty to see that your City has the best protection that money can buy. Insure your City with the Lehman Traffic Guide, a marker conspicuous by night or day that cannot be damaged by the heaviest loaded truck. The Lehman Traffic Guide is lighted by night by two bulbs which shine through ten 3½-inch ruby lenses. It stands but 5 inches high. It can be built to fit any size manhole, thus doing double duty as a traffic guide and manhole cover.

Don't Wait! Insurance tomorrow will not be of any assistance today in preventing some terrible accident.

ELKHART FOUNDRY & MACHINE CO.

SOUTH ELKHART AVENUE ELKHART, INDIANA



FRONT OF GAGE SHOWING COUNTER AT TOP OF CASE

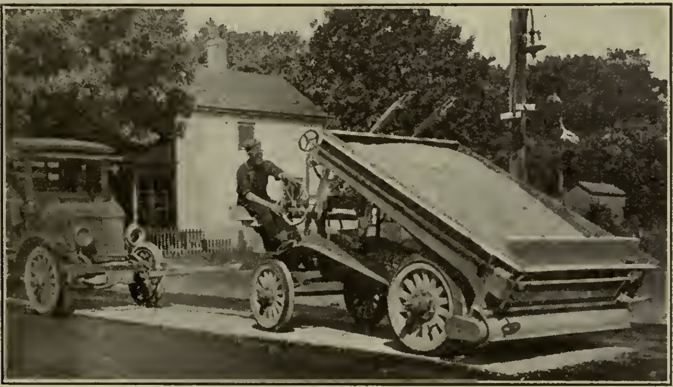
The design of this controller is extremely open throughout, all parts being easily accessible upon removing the rear cover. As the hydraulic pilot-valve is located on the outside, no water can enter the case containing the clockwork and meter mechanism. The controller is handsomely finished with engraved metal dials and an especially blended paint which matches the marble controller tables. These Venturi effluent controllers were supplied and installed by Builders Iron Foundry of Providence, R. I.

A Chip and Sand Spreader

After several years of experimenting and actual road tests under hard working conditions, the Universal Road Machinery Company, Kingston, N. Y., has placed the Reliance chip and sand spreader on the market to meet the demand for spreading-equipment to take the place of hand labor. This spreader is a piece of practical equipment which will place a blotter coat of chips or sand on oiled surfaces and will spread as much material as ten or twelve men could by hand. It is claimed that it spreads with absolute evenness, and the quantity of material can be regulated by means of the tail-gate, which is raised and lowered by a hand wheel operated from the driver's seat.

The Reliance spreader distributes the material to a width of 8 feet, which is the operating width of the ordinary oiler. A battery of two machines can cover the oiled strip as quickly as the oil can be applied.

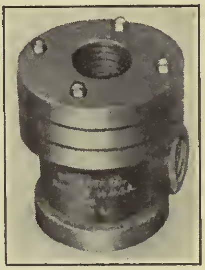
The spreading unit operates in the reverse direction, placing the cover ahead of the wheels so as to avoid running in the oil, and the power, which can be a truck, roller or tractor, can be used to push the spreader or haul it on an offset as desired. The unit was designed to be operated with a Fordson tractor, which makes a very cheap and efficient unit. When empty, it is handled with a draw-pole exactly the same as an ordinary trailer. It is fitted with solid rubber tires and springs, and the wheels are furnished with roller bearings. The capacity of the body is 3 tons level full, which will cover from 500 to 1,000 feet of roadway, depending on the thickness of the material spread.



CHIP SPREADER BEING PUSHED BY MOTOR TRUCK

Special Well Construction

The Clark well construction made by the H. W. Clark Company, Mattoon, Ill., comprises a combination of special fittings to close the top of an operating tubular well, providing an hermetic seal at this point, and with means by which the well-strainer can be cleaned by back-flushing with water, steam or air. This seal prevents contamination from surface water, foul air or foreign impurities that might otherwise enter the top of the well.



THE CLARK SPECIAL WELL TEE

The operation of the pump creates a vacuum on the entire well system, in many cases greatly increasing the supply therefrom. Capacities have been increased as much as 60 per cent by this means. The vacuum formed is indicated by a vacuum gage which forms a reliable and convenient telltale of the condition and efficiency of the plunger pump at all times; as with a constant working vacuum, a lowering of the vacuum is conclusive evidence of worn or leaky pump valves or packing.

New Organization

When the Pittsburgh Filter and Engineering Company's business was liquidated, F. B. Leopold organized a group to carry on the business. This organization has now been incorporated as the F. B. Leopold Company. The new company will design and construct filter plants and furnish all of the equipment necessary, such as dry feed machines for chemicals, controllers, gages and operating tables.

1—This Barber-Greene saved McGuire & Rolfe, Inc., $3,000 last season, picking up excavation in Richmond, Va.

2—Working in close quarters at McGrady Bros., Pittsburgh, five yards of material were loaded in three minutes.

3—The disc feeder digging into stone. No shovel clean-up is ever needed.

4—In the summer, Worcester, Mass., converts its snow loader into a bucket loader. It loads a gravel car in one-fourth the time eight men previously required.

5—The street commissioner of Worcester says his Barber-Greene Snow Loader takes the place of 100 men.

The snow loader that pays for itself in summer

The Barber-Greene Snow Loader that cleared last winter's snows from the streets of Providence, R. I., is grading the city's streets this summer.

It was recently put to work at cutting road to grade. The soil was a hard sand-clay, but the Barber-Greene, converted to a Self-feeding Bucket Loader, cut through it with no difficulty at all. It was not even necessary to plow the ground first.

The United Electric Railway of Providence also owns two Barber-Greene Snow Loaders which are converted into Barber-Greene Self-feeding Bucket Loaders for summer use.

The three Barber-Greene Snow Loaders in Providence prevented business losses amounting to hundreds of thousands of dollars last winter. Where a heavy snow would formerly create protracted traffic tie-ups, the Barber-Greene has lessened these, and in many cases eliminated them entirely.

Its winter service alone would make the Barber-Greene a most profitable investment in any city that has one or more fairly heavy snows in a year. And when the same machine, with a simple alteration, will pay for itself in one or two summers' work in building and repairing streets, it becomes an investment doubly valuable.

"Results on Road Jobs" will show you, with pictures and detailed descriptions, the material-handling layouts employed, and the results obtained, in every section of th United States. "Mechanical Snow Handling" will illustrate and explain the snow fighting methods that are in use in many cities. Both have a fascinating and valuable story to tell you. Send for them now.

BARBER-GREENE COMPANY—*Representatives in Fifty Cities*—515 W. Park Avenue, Aurora, Illinois

BARBER B G GREENE

Portable Belt Conveyors Self Feeding Bucket Loaders

Coal Loaders . . . Automatic Ditch Diggers . . Coal Feeders

Gasoline Engines in the Municipal Field

The value of the gasoline engine as a standby unit or as a power unit for emergency work in the municipal field is very great. It may be used for the operation of electric generators in municipal central stations, for standby power at the water-works for the operation of centrifugal pumps, and as part of the equipment of fire-boats.

Norfolk, Va., has a fire-boat named the Vulcan which is a converted Navy tug. It is equipped with four centrifugal pumps, each rated at 1,400 gallons per minute, 125 pounds pressure, and actually delivered 1,500 to 1,600 gallons, or over 6,000 gallons per minute, using four Sterling gasoline engines made by the Sterling Engine Company, Buffalo, N. Y., each engine being a 6-cylinder outfit operating at 1,200 to 1,500 revolutions per minute.

Jacksonville, Fla., has a fire-boat, the John H. Callahan, which is a converted Navy submarine chaser, which can throw a 3-inch stream 335 feet high under 250 pounds pressure. The motive power behind this stream is four Sterling "Straight Eight" engines of 300 h. p. each, operating four centrifugal pumps. They operate at 1,250 revolutions per minute, giving 6,000 gallons per minute at 150 pounds pressure, and at 1,495 revolutions per minute, 4,760 gallons per minute at 256 pounds pressure.

Ironwood, Mich., has an 8-cylinder Sterling 240-h. p., 1,200-r. p. m. engine operating a 5-stage centrifugal pump which delivers 1,050 gallons per minute at a 650-foot head. On one occasion this pump ran nine days constantly, furnishing the town with its entire water-supply.

South Jacksonville, Fla., is one of the many cities which have 1,200-r. p. m. 120-kilowatt generator sets powered with 8-cylinder Sterling engines.

Brockville, Ontario, has two Sterling 8-cylinder engines which are used as power for a generator or a centrifugal pump, requiring 1,200 revolutions, 180 h. p each.

Painting Traffic Lines by Machine

A machine for the mechanical marking of streets, highways, special zones for the control of traffic, and tennis courts, is being manufactured by the Simons Paint Spray Brush Company, 17 Maryland Avenue, Dayton, Ohio. This machine is mounted on specially designed roller-bearing disk wheels fitted with rubber tires. The outfit is easily handled and controlled to meet the ordinary or the special marking conditions found in city streets and public highways. The machine can distribute paint of any special consistency, mixed for extremely rapid drying conditions, even paint that will dry in seven minutes, according to the manufacturers.

THE VULCAN, FIRE-BOAT OF NORFOLK, VA., IN ACTION

Twelfth Street, N. W., Washington, D. C., paved with Trinidad Lake Asphalt in 1881. Still in good condition.

Sir Walter Raleigh was right!

"It melteth not in the sun"—wrote Sir Walter in describing Trinidad Lake Asphalt—a material with which he had caulked his ships while stopping at the Island of Trinidad.

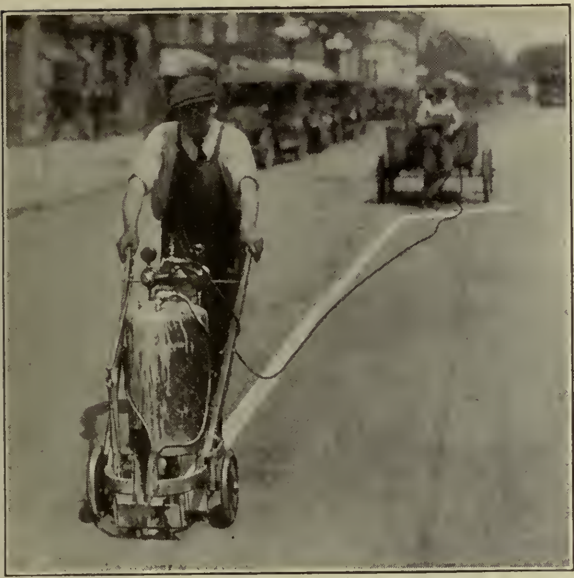
Today—three centuries later—Trinidad Lake Asphalt is the "Standard Street Paving Material of the World." No other smooth-surface paving material equals it in ability to withstand the wear of traffic and the ravage of weather.

Trinidad Lake Asphalt is a nature-made, solid bitumen—not an artificially-produced, unseasoned compound. That's why a Trinidad pavement never "runs" in the hottest weather—why it is practically immune to damage by weather.

Let us send you some interesting data and service records of this remarkable paving material. There's no obligation.

THE BARBER ASPHALT COMPANY
PHILADELPHIA
New York Pittsburgh St. Louis San Francisco Chicago Kansas City

TRINIDAD LAKE ASPHALT



PAINTING A SAFETY ZONE LINE WITH SPRAY PAINTING MACHINE

As shown in the illustration, the machine is easily under the control of the operator, who can mark straight lines or center lines on highways as rapidly as he can walk. No paint hose is required, therefore the element of clogging, cleaning or renewing the hose has been eliminated.

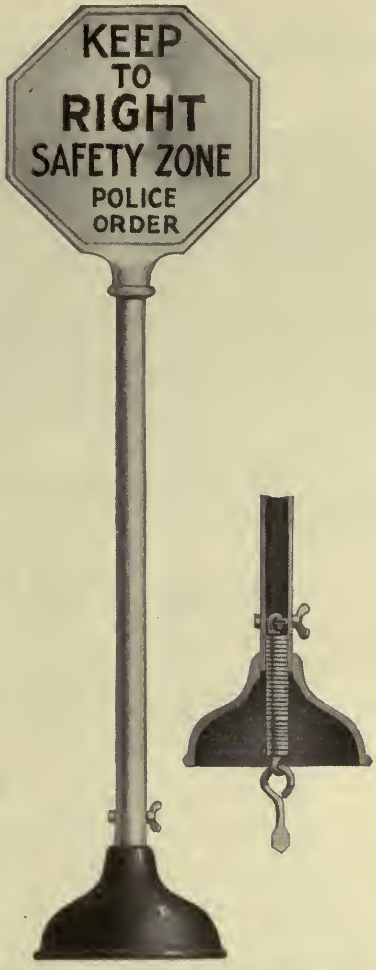
Non-corrosive, acid-resisting metal is used in the mixing valve and the working parts of the valve. These parts are strongly built, are guaranteed for two years after the date of purchase of the machine, and the manufacturers say they will refurnish them free of charge if the mixing valve fails to function properly under normal working conditions.

The machine marks a line from 3 to 6 inches wide. The distribution of the paint is controlled by compressed air furnished through a special strength air hose attached to a 1½-h. p portable gasoline engine air compressor unit that can be man-controlled as the marking machine proceeds with its work. Two men can easily handle and control the entire operation of marking without disturbing or detouring normal vehicular traffic.

Zone Markers

Proper information regarding traffic rules should be given to the tourists entering a city. Careful driving zones should be permanently and positively marked. Also "Safety" zones and "No Parking" zones should be designated by the proper signs. The ever-increasing use of automobiles demands that city officials must be ever alert to the needs of traffic regulations.

A special zone marker has been designed by the Automatic Signal & Sign Company, 1014 South Michigan Avenue, Chicago, Ill., for marking safety zones where the marker is liable to be struck by careless drivers. This marker will swerve from side to side but will return to the upright position. If struck "full on" and run over, it will lie down on the street without injury to itself or to the machine. It is easily adjusted to a ring set in the street and may be easily removed.



A STURDY SIGN THAT REBOUNDS WITHOUT INJURY WHEN KNOCKED DOWN

The marker consists of a cast iron base which weighs only 16 pounds and a 1¼-inch pipe standard 4 feet high which supports the aluminum octagonal sign, which is 13 inches wide. Near the bottom of the pipe standard a spring connects with the ring in the pavement, making it possible for the standard to right itself quickly if it should be knocked over. The zone markers come with various wordings to suit the requirements of the location.

San Diego Engages Nolen

The city of San Diego, Calif., has engaged John Nolen, city planner, Cambridge, Mass., to complete a definite and comprehensive plan for the sane and well-ordered growth of the community industrially, commercially and socially. The plan will not only take into consideration the more obvious details, such as a scientific layout of a perfected boulevard system, zoning and a civic center, but will recommend definite waterfront improvements, such as a yacht basin, and

A SPEEDY TRUCK
Powered by
the World-Famous
WILLYS-KNIGHT MOTOR

$1095
Chassis f. o. b. Detroit

Here is a newer, greater Federal — the crowning achievement of Federal's long, successful career!

All the Federal sturdiness and dependability—PLUS the power and economy of the Willys-Knight sleeve-valve motor—now made available to truck users in the new FEDERAL-KNIGHT.

No valves to grind—no carbon-cleaning—50% of the usual upkeep cost banished at one single stroke!

Over long hauls, under full load, Federal-Knights have averaged over 17 miles per gallon of gasoline.

FEDERAL MOTOR TRUCK COMPANY
DETROIT, MICHIGAN

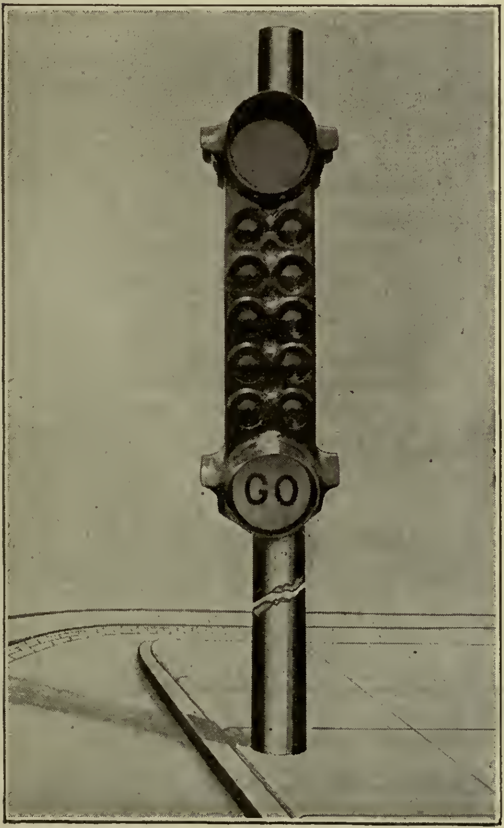
FEDERAL-KNIGHT
A SPEEDY BUSINESS TRUCK

the allocation of the entire harbor into districts to be devoted exclusively to recreational, light industrial, wharfage, manufacturing, commercial or terminal uses.

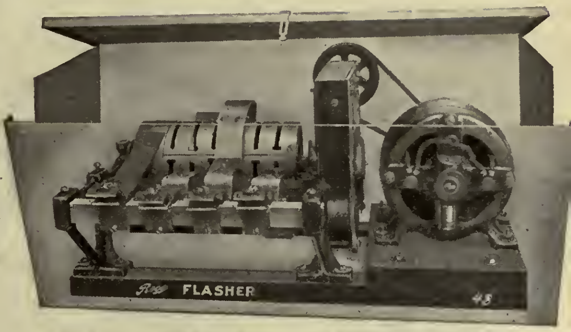
An Electric Traffic-Control Device

The Attica traffic-control system, which has been developed by the Attica Traffic Signal Company, 330 Paxtang Avenue, Harrisburg, Pa., is constructed with a view to the promotion of more efficient discipline of traffic through the cooperation of drivers, pedestrians and police officials. To accomplish this end, the device is equipped with a series of five lamps in addition to the stop-and-go equipment. These lamps are so wired that they work in conjunction with the stop-and-go features, being put out automatically at regular intervals one after another until all are out, and at this point a change in direction is promptly indicated. By this means a glance at the signal reveals the approximate number of seconds before a change in direction may be expected. It is this advance information that enables a driver to comply readily with the instructions conveyed by the signal and removes all occasion for hasty and ill-timed action.

On either side of the signal a special lens visible to the pedestrian serves as his guide, enabling him to cross the intersection in safety. The signal is also equipped with an audible alarm which may be wired to sound the moment a change in direction is taking place.

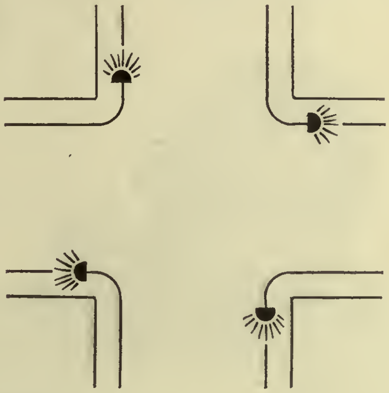


THE ATTICA TRAFFIC SIGNAL



ELECTRIC FLASHER FOR TRAFFIC SIGNAL

The proper location for this signal, which is so designed that when green is displayed along one street as a signal for traffic to move, red is displayed at the same time on all intersecting streets as a signal to stop, is a spot where it will be most conspicuous because of its prominence and the fact that it will always occupy the same location. Four units are required for an ordinary intersection, one placed to face each of the four approaching streams of traffic. The near side of the intersection, on the curb line and in line with the property line, is claimed by this company to be the only location which is available everywhere. The device may be operated on a single intersection, manually or automatically, or a series of intersections may be synchronized to operate in the same manner. A standard motor switch timed to meet the conditions existing in the zone in which it operates gives the desired time change intervals.



PROPER POSITION FOR TRAFFIC CONTROL LIGHTS

The candle-power consumption of this signal depends upon the lamps used. It is focused so that 50-watt lamps may be used behind the two large lenses and 10-watt lamps behind the small ones. If desired, 100-watt lamps may be used for the large lenses by shifting the receptacle to a position provided for this size of lamp, which is at the proper focal distance from the lens. Also, 25-watt lamps may be substituted for the 10-watt lamps, if desired.

The apparatus is one piece of cast aluminum

Two of the 1600!

Officer Primm, ready for business, on his Harley-Davidson Police Motorcycle, Kenmore, Ohio.

Harley-Davidson-mounted officer at Ravenna, Ohio — as efficient as six patrolmen combined.

TWO of many Ohio cities using Harley-Davidsons for police work are Kenmore and Ravenna—not *large* cities, but up-and-coming, and good towns for crooks to stay away from.

More than 1600 departments—from villages of five hundred population to cities of half a million—use one or more Harley-Davidsons.

They find that a motorcycle soon pays for itself (by fines from arrests that could not be made without the motorcycle). Thereafter, the machine earns the city or department a neat profit.

Professional crooks stay away, where motorcycle police are on the job. Speeders and reckless drivers take no chances. Accidents are fewer. Lives and property are saved.

No finer motorcycles were ever built than the Harley-Davidson. Investigate now for **your** city. Special Police Motorcycle literature free, on request. Write today.

Harley-Davidson Motor Co.

Dept. M **Milwaukee, Wis.**

Harley-Davidson
The Motorcycle

with a total weight of 70 pounds, a maximum length of 44 inches, and a distance of 34 inches center to center between the stop-and-go lenses. The maximum width is 14 inches. Two lugs are provided for hanging the signal, so that it may be attached to brackets or other means of support. Visors are provided for the lenses, protecting and shading them at all times, and when a change in direction is indicated it cannot be mistaken, being visible for a distance of at least one block on a clear, sunny day.

Each lamp is provided with a light and water-tight compartment and may be gotten at for inspection by removing the lens, which is held in place by a spring wire. The two 8-inch stop-and-go lenses are each provided with a reflector affording the maximum of efficiency from the candle-power light used. Lenses in red with the word "Stop" and lenses in green containing the word "Go" may be substituted for the 8-inch semaphored lenses in red and green.

Easily Used Pipe Couplings and Tees

Couplings and tees which are specially adapted for water pipes where connections have to be made in trenches, are made by George H. Snell, Attleboro, Mass. These "Easy-on" couplings and tees have no threads to be cut nor screwed up, and if the pipe is not in alignment, it makes no difference. They can be put on under water when necessary. When there is a leak in the pipe, a short piece can be cut out and a coupling put on, making a permanent repair without cutting threads, thus saving time and labor in sufficient amount to more than pay the price of the coupling.

A single coupling consists of two end pieces which slip over the pipe to be repaired. Within these end pieces are the rubber gaskets, made of a compound especially adapted for this work. The end pieces are slipped on over the ends of the pipe, and then the central tube which fits into the end pieces is placed over the cut in the line. Then all that is necessary is to tighten up evenly on the nuts acting on the two bolts until a snug repair is made. Installation of a tee is similar. The couplings and tees are made either plain or galvanized and are used in many cities as a quick, economical and easy method of repairing breaks in lines from ½ to 2 inches inside diameter.

A New Device for Weighing Trucks on the Road

Motor truck owners have grown increasingly familiar with the Loadometer made by Black & Decker Manufacturing Company, Towson Heights, Baltimore, Md., through its use by state, county and municipal officials to check overloading. While the Loadometer has proved successful in every way, it at first required several minutes to jack-up the truck on the weighing machine. This delay has been overcome by the new "Drive-On" Loadometer, which is a portable weighing instrument that itself weighs only 40 pounds. Because of the portability of the instrument, a suspected truck may be weighed whenever found, saving time for the inspectors and eliminating the resentment which is often created by causing the suspected truck to drive to the nearest permanent scale, or to wait while the truck is jacked-up on the older type of Loadometer. The new "Drive-On" Loadometer eliminates the necessity for any physical exertion beyond placing the instrument on the road in line with the wheels of the truck to be weighed. The truck is moved onto the weighing device under its own power. Measurements are taken of the two front wheels and then the two rear wheels, the total reading being the weight of the truck.

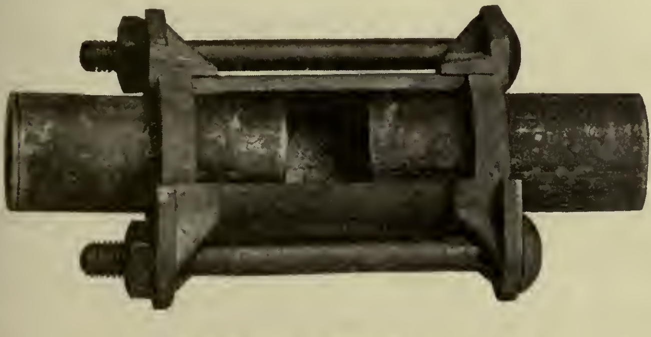
MEASURING A TRUCK'S LOAD ON THE ROAD

Stutz Increases Manufacturing Facilities

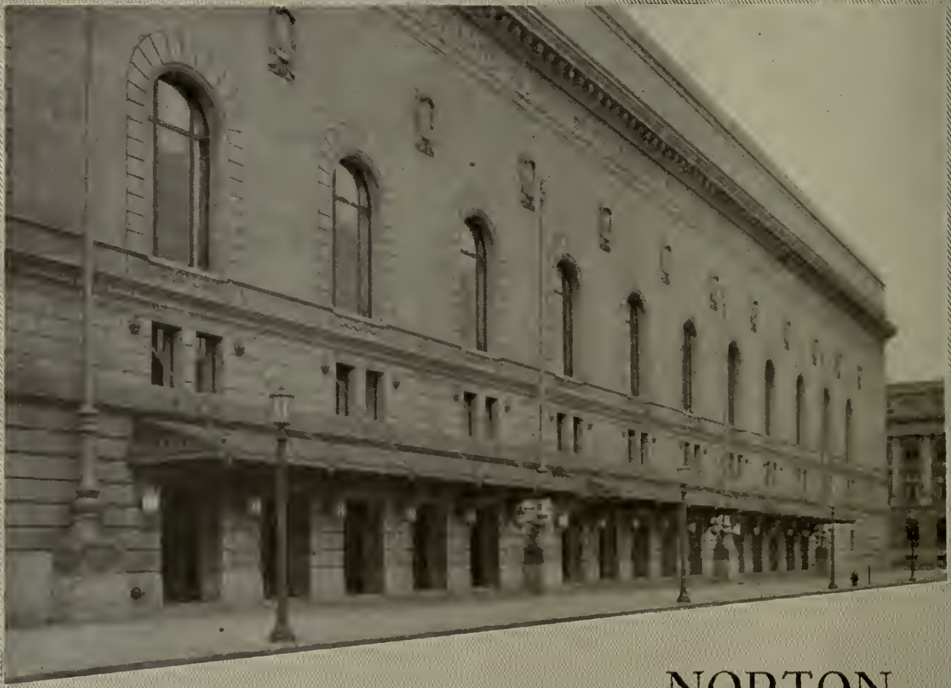
Because of the rapid and continuous increase in its business, the Stutz Fire Engine Company, Indianapolis, Ind., has materially increased its manufacturing facilities through acquiring the real estate and buildings of the Millholland Machine Company, 1102 West 23d Street, Indianapolis.

A New Horizontal Hoist for Dump-Trucks

Truck drivers and operators are familiar with the screw-jack which is used for the raising of wheels of trucks from the street for repair or tire changes. The same principle is used in the new Van Dorn Underbody Screw-type hoist which is being made for dump-



THIS OUTFIT MAKES A QUICK PIPE REPAIR



The Cleveland Auditorium and NORTON FLOORS

Fifteen thousand persons may leave the Cleveland Auditorium—scene of the Republican National Convention—with safety and in a surprisingly few minutes. This is largely due to the fact that there are no stairways. All exits are by means of ramps, all of which are covered with Norton Floor Tile (Alundum). The architects of this famous structure, Messrs. Frederick H. Betz, F. R. Walker and J. H. McDowell, provided for durable, quiet, slip-proof ramps by specifying Norton Tile.

Types of Norton Floors

Alundum Floor Tile
Alundum Stair Tile
Alundum Ceramic Mosaic Tile
Alundum Mosaic Treads (mat type)
Alundum Aggregate Tile and Treads
Alundum Aggregates

NORTON COMPANY, Worcester, Mass.
New York Chicago Detroit Philadelphia
Hamilton, Ontario

T-109

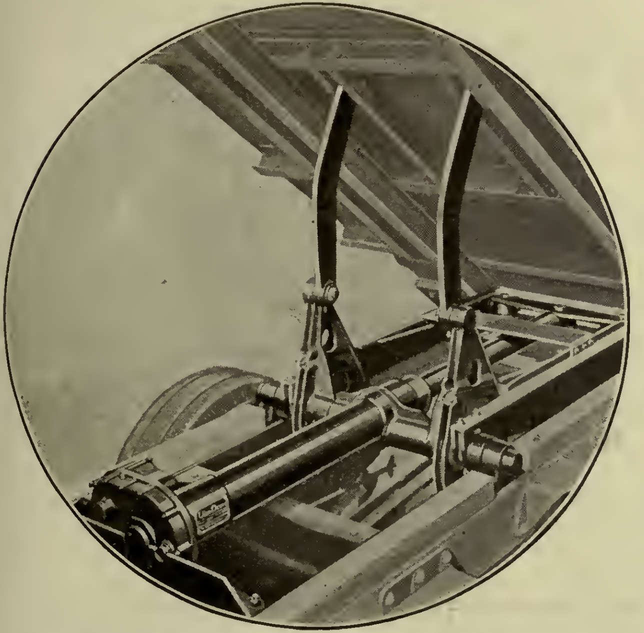
THE FOUR MAIN RAMPS FROM FIRST TO THIRD FLOOR AND ONE FROM BASEMENT TO FIRST FLOOR CONTAIN 55,000 PIECES OF NORTON TILE (ALUNDUM)

TRADE NORTON MARK

trucks by the Van Dorn Iron Works Company, Cleveland, Ohio. The hoist, which is called an "Average Duty" hoist, is the outcome of the best features of both the vertical and the underbody hoist which this company has marketed for a number of years.

In operation, the new model hoist is entirely mechanical. The power developed by the truck engine is transmitted to the lift-arms by means of gears operating a screw-jack in a plunger, which in turn operates steel cables attached to sheave-wheels; a point on each sheave-wheel is pivoted to the lift-arms, which raise the body of the truck. Freedom from any twist or bending strains due to weaving of the chassis frame or to unequal weight on the body is insured by a ball-bearing equalizing yoke, which automatically takes up any inequality at the point where pressure is applied to the cables.

All moving parts of the screw-jack are encased and run in oil, protecting them from dust and dirt. There are no complicated parts to get out of order, and weather conditions are said to have no effect on the operation and efficiency of the hoist. The body can be raised, lowered, stopped and locked at any point up to 45 degrees, the automatic stopping point. The body cannot lower by itself, thereby causing an accident. It can be lowered only by the application of power from the truck motor. In capacity this hoist can handle anything up to 7½ tons, which makes it adaptable to at least 90 per cent of the loads that are permitted on the highway to-day.



A NEW SCREW-JACK TYPE OF HORIZONTAL HOIST FOR DUMP-TRUCKS

Solving the Snow-Removal Problem

Snow removal has long been a serious problem and an expensive one to municipalities. A hard winter is a setback for a small town which has to shoulder heavy snow bills. The blockading of streets and highways for any length of time stops or delays traffic, seriously interferes with the fuel and food supply, delays industries, and endangers humanity by impeding the service of fire departments, physicians and ambulances. With the era of the automobile, particularly the commercial vehicles which now transport such a large and increasing volume of the country's products, the snow nuisance is more keenly felt.

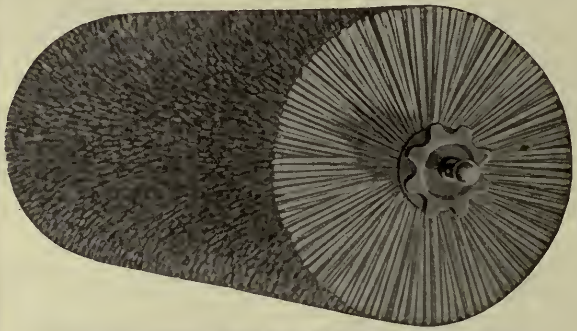
TRACTOR AND SARGENT SNOW-PLOW OPENING ROADS IN RYE, NEW HAMPSHIRE

It is claimed that the Sargent snow-plow, made by the Union Iron Works, Inc., Bangor, Maine, will clear a road as fast as a heavy tractor can drive it. This plow is the invention of Don A. Sargent of Bangor, and is an adaptation of the old-fashioned V-shaped plow with the tractor inside the V, fitted with spreading wings quickly adjusted to any width, each with an easily operated chain hoisting gear. The front or "nose" of the plow may be elevated or depressed according to the depth to be cleared, and it has steel cutting edges which make quick work of ice or hard snow.

An effective feature of this plow is the curvature of the front and also of the wings, which rolls the snow off and back rather than pushing and packing it. The tractor, although inside, applies its power in a pull, as it is coupled to a draw-bar which forms the back of the plow. The front of the tractor is connected with the front of the plow by chains so that it can pull the plow back. The plow and tractor may be turned around in almost its own length, making it very easy to handle.

The nose of the plow is a heavy steel casting. The lower or cutting edges are heavy steel plate. Heavy angle-iron is used in bracing the V inside, and the woodwork is of selected, seasoned, Maine-grown hardwood. It is made in sizes weighing from 600 pounds to 6,500 pounds.

SERVICE --- ECONOMY



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—SO WILL BRUSHES

With a Saving in Freight Charges

With the view of rendering more efficient service to Cities and Towns

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to reveal the real dependability of a Littleford heater. Use it and abuse it for a few years, keep a careful check on repair expenditures, and you'll find what most road officials know—that a Littleford Tar and Asphalt heater is not only most efficient but most economical.

All types and capacities.
Catalogue on request.

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500 East Pearl Street **Cincinnati, Ohio**

No. 69 Maintenance, shown above, is made in 3 capacities—60, 110, and 165 gals. Equipped with "Spring Cushioned Axle." Hyatt roller bearings and rubber tires if desired.

Vol. XXXI
No. 3

The American City Magazine

SEPTEMBER
1924

443 Fourth Ave.
NEW YORK

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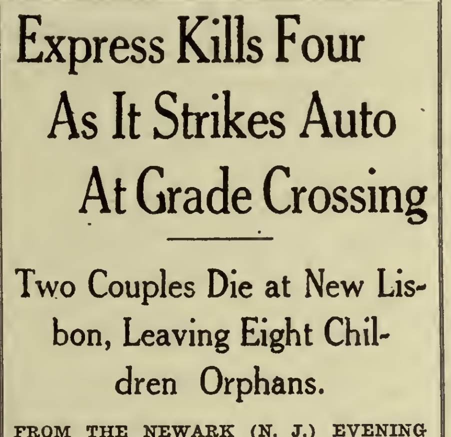
$4 a Year

A Program for Fewer Deaths at Railroad Crossings

HOW much longer shall we accept, as a common and almost commonplace occurrence, such accidents as the accompanying newspaper headings record? Is human life in America so cheap that the death at railroad grade crossings of four or five persons and the injury of twelve to fourteen others, as the daily average throughout the year, can stir us to no more adequate thinking and action than we have yet taken?



Express Kills Four As It Strikes Auto At Grade Crossing

Two Couples Die at New Lisbon, Leaving Eight Children Orphans.

FROM THE NEWARK (N. J.) EVENING NEWS, AUGUST 5, 1924

To be sure, railroad grade crossings are being gradually abolished. But in New York State, where the most rapid progress might reasonably be expected, some 8,000 grade crossings still exist. An important forward step has been taken by the New York Legislature this year in the approval of a proposed constitutional amendment to permit the loaning of the state credit to railroads and municipalities, so that their share of the cost of eliminations may be financed in the first instance by the state, the amounts thus advanced to be repaid in annual installments; the railroads' ultimate share of the total cost being 50 per cent; the municipalities', 25 per cent; and the state assuming the remaining 25 per cent. But this constitutional amendment cannot become effective until it has received the favorable vote of the 1925 Legislature and has subsequently been approved by the people; and even if thereafter elimination of grade crossings were to go forward at the rate of 200 a year—involving an annual cost, as estimated by the Pubilc Service Commission, of $20,000,000—it would require forty years to complete the job.

Meanwhile, in New York State and elsewhere, what are we going to do about it? Until we can get rid of them entirely, how shall we render more safe the 250,000 railroad grade crossings to be found throughout the United States? To help answer this question, THE AMERICAN CITY has made a study of numerous efforts and suggestions already made, and offers the following program for the consideration of public officials, railroads and motorists:

1. At the approach to every grade crossing there should be a more adequate warning than the "Look Out for the Cars" sign inherited from the leisurely days of the horse. The motorist should know at a distance of 250 or 300 feet that he is nearing a grade crossing—and the warning should be given him by a sign of uniform and distinctive color, shape and position, the meaning of which he will instantly recognize.

2. There should be a clear view of the crossing for both the motorist and the locomotive engineer. Where obstructions exist at crossings not protected by gates, such obstructions should be removed so as to clear the field of view for a distance of 250 to 500 feet along the road on each side of the railroad, and for 500 to 1,000 feet along the railroad itself.

3. The crossing of the highway and railroad should be approximately at right angles; the width of the roadway at the crossing should be fully as wide as the combined pavement and shoulders of the road; the surface should be smooth and approximately level for a distance of at least 50 feet on each side of the railroad; and beyond this limit approach grades should not exceed 5 per cent.

4. In addition to the advance warning sign mentioned in paragraph 1, every crossing should be provided with reliable automatic signals, giving warning to the ear by means of a gong, and to the eye, both by day and night, by a swinging or flashing sign; and also, at the more important crossings a watchman, with or without gates. It has also been suggested that in sections which are poorly lighted at night, a large electrically lighted rectangular sign carrying the word "Danger" in red letters should be suspended directly over the center of grade crossings.

SEVEN CARS DERAILED IN CRASH WITH 10-TON TRUCK NEAR CRANFORD

Driver and Helper on Automobile, One Passenger and Fireman Are Instantly Killed—Engineer Has Both Legs Broken—Baggage Car Piles Up in Wreckage.

FROM THE NEW YORK EVENING WORLD, AUGUST 21, 1924

5. The so-called "island" or "fool-proof" construction which provides an obstruction in the traffic stream, compelling the slowing up of traffic at grade crossings, has been tried to a limited extent, and may merit further experimentation.

6. In at least five states, traffic laws require all automobiles (with, in some cases, exceptions) to come to a full stop before crossing a railroad at grade; and such laws, much varied in detail, are in force as regards carriers for hire, in no less than sixteen states. Seven states have regulations, applicable to all automobiles, requiring a reduction of speed but not calling for a full stop.* It is obviously idle to expect a hundred per cent compliance with such laws; but the reduction in accidents which has resulted in certain cities from compelling automobiles to come to a full stop before crossing "through traffic" boulevards suggests the possibility of educating motorists more generally to treat railroad crossings with similar respect.

Instead of requiring all automobiles to stop at every railroad crossing, it has been suggested that State Highway Departments be authorized by law to designate with appropriate signs the more dangerous crossings, before which (unless protected by a watchman) a full stop shall be made; and that motorists be advised, but not required, to stop in a similar manner before all other grade crossings.

7. Interurban electric railway crossings are danger spots deserving much the same consideration as those of steam railroads.

8. To make effective the foregoing program, and any other plans for reducing the grade crossing toll, a more effective coordination of forces in each state is desirable. An opportunity for civic service of the first importance awaits the leadership, in the various states, of citizens' organizations or governmental bodies which have the energy and public confidence to become the coordinating force, be they State Chambers of Commerce, State Automobile Associations, State Highway Commissions, State Railroad or Public Service Commissions, or State Leagues of Municipalities. Such a state-wide movement might well have a three-fold object: (a) more rapid elimination of grade crossings; (b) increased protection at existing crossings; and (c) more effective education of motorists in common sense as expressed in the American Railway Association's new poster—"Wait, You May Lose."

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* For an analysis of the various state laws regulating vehicles at crossings, and an editorial on "Lawmakers' Efforts to Make Crossings Safe," see the *Railway Age* for November 3, 1923.

Comments Invited

THE AMERICAN CITY invites for publication in a future issue, comments on the foregoing program for fewer deaths at railroad crossings, and information regarding other methods which are proving effective.

Planning the Financial Program for the New Water-Works in the Small Town

By Richard Messer

Chief Engineer, Virginia State Board of Health

CAN the small town afford a water-works system? Will the yearly income, at reasonable rates, be sufficient to cover the interest, sinking fund and operating charges, or will it be necessary to make the rate successive in order that the water-works may be self-sustaining? These are the questions which will be in the mind of every citizen when he or she votes on the bond issue.

The following discussion with regard to the income which may be expected at given rates, the operating expenses and the approximate first cost of the water-works system in a town of 1,500 population may be helpful to local officials who have under consideration the question of a new water-works. The methods as outlined for estimating the quantities of water which will be paid for and how the rate schedule should be worked out, may be used for towns and small cities of less or greater population than is assumed in the examples.

How to Finance

This is the big problem, particularly for the small community wishing to build its first water-works. This study has been specially prepared to crystallize the best practice in financing a well-considered plan. A proper sequence in studying all of the physical features is necessary even before financing may be considered.

Primary Considerations

That a public water-supply for even the small village of 300 or 400 inhabitants is desirable is admitted. As the town grows larger a common supply becomes a necessity for health reasons and for protection against fire. At what stage in the growth of a given place the people will decide to vote bonds for water-works is dependent upon many factors, such as the nature of existing private supplies, the ever increasing danger of fires, especially in the business districts, the topography, the number of miles of pipe which will be required to reach the majority of houses, and finally whether there are one or more industrial plants which will purchase a considerable portion of the water. Due to the variation in local conditions, the first cost for water-works systems may range all the way from $30 per capita to $100 per capita. The yearly operating expenses, in addition to the interest and sinking fund charges, likewise cover a wide range for obvious reasons.

The issue of bonds for a new water-works is an important step in the history of any town. Before a majority of the citizens will be in favor of incurring a thirty-year debt, they must be convinced that the revenues will be sufficient, or nearly so, to meet the operating expenses. The logical manner of obtaining the information is first to employ an engineer to make an investigation and report on the best supply available and the cost of the works complete, and then to estimate the annual revenues and state the rates on which these are based. The proper way is first to ascertain the cost of the investment and operating expenses and from these determine the schedule of rates.

Public sentiment in favor of a water-works does not change over night. Before the engineer is called in, the matter has been discussed for several years, in fact many of the thinking citizens have practically declared themselves in favor of the move. Of course there are numerous instances on record where a sudden decision to install a water-works has been brought about by a severe typhoid epidemic or a serious conflagration.

Use of Water

Although it is well known that the per capita consumption varies from 30 up to 150 and sometimes 200 gallons per day in different places, the water actually used for ordinary purposes (that part classed as domestic) is approximately the same for places of smaller size. As cities increase in size the per capita consumption increases usually at the rate of one or two gallons per year on an average. The variation spoken of above for different places is due to quantities furnished for industrial purposes, leakage and waste. Furthermore, it must be remembered that the figures for the per capita consumption are in most cases based on the quantity of water delivered into the distribution system and are not the quantities actually sold. A superintendent who can account for 85 per cent of the water which enters the distribution system is doing very well. In many places the water unaccounted for exceeds 25 per cent.

Therefore it is possible to estimate for a given place, with a fair degree of accuracy, the quantities of water which will be sold for domestic purposes as classified in the schedule adopted below and also the approximate number of services and quantities of water which will come within the intermediate classification. Water for manufacturing purposes as classified in the schedule obviously must be ascertained for each place. This information is usually available.

It is realized that the method of procedure as outlined is not in accordance with the advice given at the beginning of the discussion. However, by assuming certain charges for water, which charges are believed to be reasonable, and on the basis of these estimating the revenues and then the operating expenses, some idea may be obtained as to the amount of money which may be invested in the water-works system.

Sources of Revenue

The figures for water sold which are used in the tabulations given below, are based on averages for several towns each of about 1,500 population. It is believed that the averages, 100 gallons per meter per day for domestic use and 1,500 gallons per meter as coming under the intermediate classification, are conservative.

In devising a schedule of rates, the primary object is to so distribute the charges that property owners and water consumers will pay in proportion to the service actually rendered. Every water-works system, including the storage reservoir, pumping station, supply lines and distributing pipes, is designed for the purpose of furnishing fire protection as well as water for other uses. For towns and cities up to 5,000 and even larger, the cost for fire protection requirements usually ranges from 50 to 75 per cent of the entire cost of the works.

Thus it is seen that for small cities at least half of the money expended is primarily to protect property. The individual or company owning a building valued at $100,000 should pay more for its protection than the individual who owns a house valued at only $5,000. Consequently the charge for the service should not be based solely on the quantity of water used because only 3,000 gallons per month may be furnished to the large building while the family in the home may use as much or even more. Hence a certain portion of the revenue should be taken from the general tax fund or obtained by special taxes assessed according to the value of the property protected.

Keeping in mind a fair distribution of charges in accordance with value of service rendered, how much of the revenue should be obtained by the taxes on property? The most scientific discussion of this subject is contained in the report by Metcalf, Kuichling and Hawley printed in the *Proceedings* of the American Water Works Association, 1911, pages 62-149. Since then there have been numerous decisions by public utility commissions fixing the amounts of revenue for fire protection service for places of different sizes. For a population of 1,500 a total amount of $2,250 per year for fire protection service is reasonable. For a population of 2,000 the revenue should be $3,000 per year, which is an amount equal to $1.50 per capita. For cities larger than 5,000 the proportionate amount begins to decrease gradually.

The remaining revenues should be derived from:

(a) Service charges

(b) Sale of water

The service charge, or in other words, a charge to take care of the maintenance of service and meter, is now recommended by both the American Water Works Association and the New England Water Works Association. For reasons as given in the final reports, the service charge is much more fair to the water consumers as a whole than the usual minimum charges that are in vogue in many cities.

In these same reports the quantity of water per month or per quarter, as the case may be, is also recommended as most fairly distributing the charges among domestic, intermediate and manufacturing consumers. The schedule is also more simple than the complicated "slide scales" customarily adopted.

In the following examples the amounts of service charges and the prices per 1,000 gallons are assumed for this discussion only, and from what has been said above, it should not be inferred that the figures are as recommended by the Associations.

Example No. 1

A town with a population of 1,500; 250 active taps (six persons per tap); supply from a 10-inch well, 300 feet deep; a deep-well pump, motor-driven, capacity 60 gallons per minute, delivering supply directly to an elevated tank about 100 feet high, having a capacity of 50,000 gallons. It is further assumed that there are no consumers using as much as 750,000 gallons per quarter (8,333 gallons daily), or, in other words, that none of the water furnished comes under the classification for manufacturing purposes as given in the rate schedule. The conditions above described apply to many towns of this size. Usually a deep well located in or near the town is the cheapest and best supply available until such time as more water than the well will furnish is required.

The number of active taps includes stores and other taps in addition to residences. In the cities and towns 100 per cent served, the number of persons per tap is usually about five and often as low as four. Hence the figure 250 taps makes allowance for some houses which may not be served for a number of years.

The service charges are figures to cover the maintenance of services and meters, both of which should be installed and owned by the town. These allow for a depreciation of about 10 per cent yearly and in addition cover the cost of meter reading, billing and also for a certain amount of water which will slip by unregistered. For the larger meters the charges take into account, to some extent, the larger sizes of pipe lines necessary to supply the full capacity of meter at any moment.

In the example given the number of meters and charges will be as follows:

Size of Meter	Number of Meters	Charge per Quarter	Total Amount per Quarter
⅝-inch	240	$1.50	$360.00
¾ "	6	2.25	13.50
1 "	2	3.00	6.00
1½ "	1	4.50	4.50
2 "	1	7.50	7.50
Total	250		$391.50
Total per year from service charges			$1,566.00

Note.—Service charges per quarter for larger meters as follows: 3-inch = $15; 4-inch = $22.50; 6-inch = $45.

The third and remaining source of revenue is from the sale of water. For all water delivered in addition to the service charge there shall be a charge for all water delivered as follows:

Domestic—First 75,000 gallons per quarter @ 35c per 1,000 gallons
Intermediate—Next 675,000 gallons per quarter @ 25c per 1,000 gallons
Manufacturing—All over 750,000 gallons per quarter @ 18c per 1,000 gallons

Based on averages for a number of towns of similar size, the quantity of water actually paid for may be estimated as follows: 241 meters will show an average of 9,100 gallons each per quarter, making a total of 2,193 thousand gallons classed as domestic, and 9 meters will show an average of 136,500 gallons per quarter (1,500 gallons daily), making a total of 1,230 gallons as coming in the intermediate class. Of this latter (75,000 x 9) 675 thousand gallons must be paid for at the domestic rate of 35 cents. The following table shows this more clearly:

Number of Meters	Total per Quarter 1,000 gallons	Classified for Payment	
		Domestic	Intermediate
241	2,193	2,193	
9	1,230	675	555
Total 250	3,423	2,868	555

2,868 thousand gallons @ 35c	$1,003.80
555 thousand gallons @ 25c	138.75
Total revenue per quarter	$1,142.55
Total revenue per year	$4,570.20

It should be noted that the average daily quantity of water sold is about 38,000 gallons, or 25 gallons per capita. Assuming 75 per cent is accounted for, the daily pumpage will be about 50,000 gallons, or 33 gallons per person.

Summary of Revenues for Year

For fire protection (general tax fund)	$2,250.00
Service charges	1,566.00
Sale of water	4,570.20
Total	$8,386.20

In the above estimate about 60 per cent of the domestic consumers will use less than 10,000 gallons per quarter, making a yearly bill for water, including the service charge, of $20 and less for 150 of the consumers.

Will the above cover the operating expenses, interest and sinking fund and what amount may be invested in the works, are the next questions which must be answered.

The operating expenses of the entire water-works system per month will be about as follows:

Electric power @ 5c. per kw. hr.		$110.00
Superintendence		150.00
Extra labor, supplies and expenses		50.00
Total		$310.00
Total per year	$3,720.00	
Allowance for depreciation	580.00	
Total operating expenses per year		$4,300.00

The balance of the yearly revenue which may be invested in the plant is $4,086.20 ($8,386.20 — $4,300). Since the interest and sinking fund requirements would be 7½ per cent, bonds to the amount of $55,000 may be issued.

Whether the $31,500 will be sufficient to construct the entire distributing system depends on the local conditions. At least it will provide enough pipe to reach the majority of the consumers. And then there is always a chance of an industrial consumer's increasing the revenue, which will make extensions possible from time to time.

Most towns of 1,500 have at least one consumer which will use as much as 750,000 gallons per quarter (8,333 gallons per day) and some have several. Tanneries, creameries and ice plants, woolen mills and many other industries require large quantities of water. Sometimes a railroad company will use from 15,000 to 50,000 gallons per day.

The first cost of the investment will be about as follows:

Land, engineering, supervision of construction and other preliminary expenses	$12,000.00
Well at $7.50 per foot	2,400.00
Pump house and pump	2,800.00
Elevated tank	5,500.00
Pipe and connections	800.00
	$23,500.00
Remaining for distribution system	31,500.00
Total cost	$55,000.00

Example No. 2

Town of 1,500 with 253 active taps. Three additional meters are:

One 3-inch averaging 10,000 gallons per day

Two 4-inch each 20,000 gallons per day

Total water classed as manufacturing, 50,000 gallons per day

The service charges and charges per 1,000 gallons are assumed the same as in Example No. 1, service charges of $60 per year and $90 per year being placed on the 3- and 4-inch meters respectively.

In this example it is also assumed that the only supply available is from a near-by river or creek and that the water must be filtered and chlorinated and then pumped to an elevated tank of 75,000 gallons capacity, or a concrete reservoir of somewhat greater capacity located on a hill in the town. The filter plant will have a capacity of about 500,000 gallons per 24 hours with motor-driven centrifugal pumps 350 gallons per minute each and a total head, including the low-lift pumps, of 175 feet.

The revenues will be as follows:

By Sale of Water (Quantities in Thousand Gallons)

	Number of Meters	Total per Quarter	Classified for Payment Domestic	Intermediate	Manufacturing
Domestic	241	2,193	2,193		
Intermediate	9	1,230	675	555	
Manufacturing	3	4,500	225	2,025	2,250
Total	253	7,923	3,093	2,580	2,250
		Per cent	39.05	32.55	28.40

3,093 thousand gallons @ 35c	$1,082.50
2,580 thousand gallons @ 25c	645.00
2,250 thousand gallons @ 18c	405.00
Total per quarter	$2,132.50

Summary of Revenue for Year

By sale of water	$8,530.00
From service charges	1,926.00
Fire protection (general taxes)	2,250.00
Total	$12,706.00

Note.—7,923 thousand gallons per quarter = 88,000 gallons per day = 59 gallons per capita daily.

Total per day assuming 75 per cent accounted for = 120,000 gallons.

The yearly operating expenses should be estimated first so as to find out what portion of the revenue will remain for interest and sinking fund:

Operating Expenses, Entire Works

Electric power 3,500 kw. hrs. @ 4 cents		$140.00
Superintendence		150.00
Chemicals		20.00
Extra labor		60.00
Supplies and expenses		50.00
		$420.00
Total for the year	$5,040.00	
Allowance for depreciation	860.00	
Total operating expenses for year		$5,900.00
Balance for interest and sinking fund		6,806.00
Bond issue $90,000 × 7½ per cent		6,750.00

Estimated Cost of Water-Works

Land and engineering (with supervision)	$10,000.00
Filter plant and force main	40,000.00
Elevated tank or concrete reservoir	7,500.00
	$57,500.00
Amount remaining for distribution system	32,500.00
Total cost of works	$90,000.00

If by chance the filter plant is combined with an electric or other power-plant in charge of one superintendent, the monthly operating expenses might be less than are given in the table. In a small town such an arrangement is very common.

Example No. 3

Town of 1,500 population with 253 active taps and same quantities of water sold as in Example No. 2. In this case suppose the supply is brought by gravity through an 8-inch pipe line from a spring about three miles distant and delivered into a covered concrete reservoir on a hill in or near the town; also that it is treated with liquid chlorine.

The yearly revenue is $12,706 as in Example No. 2. The next step is to estimate the operating expenses in order to determine how much can be invested in the plant:

ESTIMATED OPERATING EXPENSES PER YEAR

Superintendent (part time)	$1,000.00
Chlorination repairs and expenses	150.00
Extra labor for maintenance of system	600.00
Supplies and expenses	500.00
Total	$2,250.00
Allowance for depreciation	1,250.00
Total operating expenses for year	$3,500.00

This leaves a balance of $9,206 for interest and sinking fund. $120,000 × 7½ per cent equals $9,000.00 per year.

ESTIMATED COST OF WATER-WORKS

Engineering and supervision and rights of way	$12,000.00
Cost of rights for spring	10,000.00
Pipe line (3 miles of 8-inch cast iron)	35,000.00
Service reservoir	10,000.00
	$67,000.00
Remaining for distribution system	53,000.00
Total cost of water-works	$120,000.00

Example No. 4

Knowing the actual cost of the water-works and the operating expenses, also the quantities of water furnished for domestic, intermediate and manufacturing purposes, how can the rates for water be calculated?

It will be assumed that the annual revenues for fire protection and service charges are as given in Example No. 3 and that the quantities of water for domestic, intermediate and manufacturing purposes have been found from meter readings to be the same as in Example No. 3.

Suppose that the cost of the water-works system complete is $90,000 and the operating expenses (including an allowance for depreciation) are $3,000.

The total yearly charges will then be:

Interest and sinking fund (90,000 × 7½ per cent		$6,750.00
Total operating charges		3,000.00
Total per year		$9,750.00
Part of this is derived by:		
Fire protection	$2,250.00	
Service charges	1,926.00	$4,176.00
Balance for year from sale of water		$5,574.00
Per quarter		$1,394.00

Since the total quantity of water per quarter for all purposes is known to be 7,923 thousand gallons, the average cost is $1,394 ÷ 7,923 = 17.6 cents per 1,000 gallons.

The tabular form of computing the prices per 1,000 gallons, after assuming the ratios between domestic, intermediate and manufacturing uses, is given in "Meter Rates for Water-Works," by Allen Hazen, page 176:

Class	*Total Quantity per Quarter	*Per Cent of Total	Relative Ratio	Product
Domestic	3,093	39.05	2.00	78.10
Intermediate	2,580	32.55	1.46(1)	47.52
Manufacturing	2,250	28.40	1.00	28.40
	7,923	100.00		154.02

Class	Ratio of Required Rate to Average Rate	Required Rate Average being 17.59c
Manufacturing	1.298(2)	22.9 cents
Domestic	0.948(3)	16.7
Intermediate	0.649(4)	11.4

* As classified for payment (See table in Example No. 2)

(1) One-half way between mean proportional of domestic and manufacturing rates

(2) $= \frac{2.00}{1.54}$ (3) $= \frac{1.46}{1.54}$ (4) $= \frac{1.00}{1.54}$

To be on the safe side and to use even figures, the charges will be fixed at 23 cents, 17 cents and 12 cents respectively. Then referring back to the quantities of water as classified for payment in Example No. 2:

3,093 thousand gallons @ 23 cents	$711.00
2,580 thousand gallons @ 17 cents	439.00
2,250 thousand gallons @ 12 cents	270.00
Per quarter	1,420.00
Per year	$5,680.00

Summary and Remarks

The relative rate per 1,000 gallons of water for manufacturing and domestic purposes should not exceed a ratio of 1 : 2, as recommended in the report adopted by the American Water Works Association.

Attention is called to the allowance of about 1 per cent of the cost of the water-works and included in the yearly operating expenses. This is in addition to the sinking fund depreciation included in the fixed charges. This extra amount should be set aside so as to earn the equivalent to compound interest but so held that any part of the accrued amount will be available for replacement of pumps or other major units as required. It is also proper to use part of the fund, so set aside, for new extensions. If the water-works is self-sustaining, as it should be, the funds so invested in new extensions will earn the 7½ per cent required for interest and sinking fund charges.

If the rate schedule adopted when the system is new brings in sufficient revenue to meet fixed charges and operating expenses, the same rates will probably result in an annual surplus after a number of years (a) because of the natural growth of small towns (about 25 per cent in every ten years), and (b) the increased quantities of water sold for industrial purposes. In some cases the annual surplus may be sufficient to finance such extensions of plant as will be needed. In the long run this method of financing additions to fixed capital, the "pay as you go" plan, as it is sometimes spoken of, is cheaper than adjusting the rates from time to time, with the object of keeping the annual revenue sufficient only to meet the fixed charges and operating expenses, and then issuing bonds each time extensions are made.

The water-works accounts should be kept separate from accounts for other utilities and departments and none of the surplus should be used to carry other utilities and departments, as is often done in some places. The form for uniform accounting adopted by the New England Water Works Association (*Journal,* March, 1921), has condensed statement forms applicable for the smaller plants and also more detailed statements for large water-works systems.

A considerable part of the discussion has been devoted to the question of rates for the reason that this is the most important phase of any financial program. Whether or not sufficient income may be obtained at rates which are within reason to make the water-works self-sustaining depends a great deal on local conditions which influence the first cost of the plant. The examples given are typical for many places with populations of 1,500, and it is believed that the average figures for quantities of water sold and the estimated costs are conservative.

Model City Featured at Auto Show by St. Louis Safety Council

AT the 1924 Automobile Show in St. Louis a unique feature was a model city with miniature safety signs and signals, exhibited by the St. Louis Safety Council. These traffic-regulating devices were typical of those used in the streets of St. Louis, which include:

"Quiet Zone" signs, near hospitals

"Playground" signs, adjacent to playgrounds

"School, Drive Slow" signs, placed in the center of streets near all school buildings

"No Parking" signs, where parking is to be eliminated in the entire block. "No Parking" signs, where business houses have 30 feet reserved for the loading and unloading of merchandise

"Safety Zone" signs, which accommodate the public in boarding street cars

"Slow—Hazard" signs at dangerous intersections to warn motorists

"Stop" signs, where a great hazard exists and where it is necessary to stop even when the intersecting street is not a boulevard

"Stop" signs at fire-engine houses, requiring all street cars to stop before proceeding by these houses

Automatic Redflex signals, placed at dead-end streets

Automatic traffic policemen, which regulate the movement of traffic at certain intersections

"Boulevard—Stop" signs, which are placed at all boulevard intersections, requiring motorists to stop

These signs, as used in the streets of the city, are made and erected, with two exceptions, by the Department of Streets and Sewers of St. Louis.

Automobile Fatality Chart 1918 to 1923
CHAUFFEURS TRAFFIC SCHOOL
Central High School
Free
Auditorium
Enrol Here & Program Will be Mailed you
ST. LOUIS SAFETY COUNCIL
A STUDY IN TRAFFIC SAFETY SIGNS & SIGNALS AS USED IN THE CITY OF ST. LOUIS

A MODEL CITY WITH SAFETY SIGNS AND SIGNALS AS USED IN ST. LOUIS

The automatic traffic policemen, which regulate the movement of traffic, are manufactured by Klug & Smith Automatic Controlling Device Company, of Milwaukee, Wis.

The playground signs and safety zone signs are donated by the Automobile Club of Missouri. A new type of "Boulevard—Stop" sign is being planned which will be furnished by the St. Louis Auto Club.

The "School Zone" signs are supplied by the Board of Education.

A Study of Filter Sand for Municipal Water-Supplies

By W. M. Weigel

Mineral Technologist, Bureau of Mines, Washington, D. C.

THE use of sand for the filtration of municipal water-supplies is of comparatively recent use in this country, although at the present time most cities of any size that draw their water-supplies from surface sources use sand filters in their purification systems. Not only are sand filters employed to remove sediment and suspended matter, but they also take out most of the bacteria in the water.

The first comprehensive research and study of sand for this purpose was probably that of Hazen for the Massachusetts Board of Health in 1891 and 1892,* although sand filters had been employed for a considerable time before. Specifications for filter sand drawn since then have been largely based on the results of Hazen's work.

Requirements

The general requirements for filter sand are more exacting than for any of the other kinds of sands, except the chemical specifications for glass sand. Filter sand must be uniform in size and within certain limiting sizes. In addition, it must be clean and free from clay and organic matter and of fairly high purity. Early investigations established the fact that an excess of fine material increased the friction and decreased the rate of flow through the filter, and that the size of the finer particles, rather than the coarser, determined the effective size; also, that large grains tended to cause irregularities in flow in different parts of the bed. There is no requirement as to grain shapes, except that they be not flat or elongated, since, so far as known, either rounded or angular grains are equally efficient.

Based on Hazen's investigations, two factors are quite generally used to control the average size and uniformity of size of the sand. These are defined as follows: The "effective size" of a sand is such that 10 per cent by weight of the sand is finer than this size, and 90 per cent is coarser. It is expressed in millimeters. The "uniformity coefficient" is defined as the ratio of the size of grain which has 60 per cent finer than this size to the size which has 10 per cent finer (the "effective size"). It is evident that the smaller this coefficient, the more uniform is the sand. If all the grains were exactly the same size, the coefficient would be 1.

The ordinary method of determining the effective size and uniformity coefficient is to make a screen analysis of the dry sand. The cumulative percentages are then plotted against the size of the screen openings. The intersection of the curve with the 90 per cent line gives the effective size, that is, 10 per cent is finer than this. The size corresponding to the 40 per cent value (60 per cent is finer than this), is read from the plot and this divided by the effective size gives the uniformity coefficient. The use of coordinate paper, in which percentages are laid off on the vertical axis numerically and the logarithms of the sizes of screen openings along the horizontal, makes a convenient form. Printed blank forms ruled in this way may be obtained from the manufacturers of testing sieves. This method, in reality, represents the size of opening through which the grains will pass, or on which they are retained, rather than the actual grain size. Before accurate screens were obtainable, it was customary to determine the size of grains passing a given screen by collecting the last grains passing and then by counting a known weight of these and their specific gravity being known, their diameters assumed as spheres could be calculated.

Specifications usually state, in addition, that no grains shall be larger than a certain mesh and also limit the percentage of very fine material, or that which will pass a 100-mesh sieve, as during the washing with counter-current flow, the fines collect in the top part of the sand bed and clog the filter.

Sands with effective sizes of 0.20 to 0.70 mm. are used, but those most commonly specified have effective sizes from 0.40 to 0.55 mm. The uniformity coefficient varies from 1.25 to 1.80 with 1.55 to 1.60 as an average.

The following table gives the effective size and uniformity coefficient of samples supplied by some regular producers of filter sand.

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* Report of Massachusetts Board of Health, 1892, p. 541.

Tyler standard testing sieves were used in making the analyses:

Sample No.	Source	Effective Size	Uniformity Coefficient
322	New Jersey	0.43	1.40
328	New Jersey	0.38	1.42
329	New Jersey	0.60	1.33
337	New Jersey	0.41	1.39
338	North Carolina	0.38	1.67
345	Illinois	0.42	1.26
348	Minnesota	0.33	1.60
349	Minnesota	0.44	1.52
350	Minnesota	0.37	1.55

Chemical Analysis

A good filter sand requires a rather high silica content. It is generally specified that not more than 2 per cent shall be soluble in hot dilute hydrochloric acid. Other specifications state that the combined brine and magnesia calculated as carbonates shall not exceed 2 per cent. Aside from this, the chemical composition is usually not specified.

Specifications for Filter Sand

Some condensed specifications are as follows:

Water Department, Baltimore, Md., Filtration Division, Contract No. 22:

> The sand shall be composed of hard and durable grains, either sharp or rounded, substantially free from clay, loam, dust or other foreign matter and flat particles.
>
> When crushed and powdered and digested for 24 hours in strong, warm, hydrochloric acid, without stirring, at least 95 per cent shall remain insoluble. The sand shall not contain more than 2 per cent of calcium and magnesium taken together and calculated as carbonate.
>
> The stock sand furnished shall have an effective size of not less than 0.33 mm. and a uniformity coefficient of about 1.75. At least 90 per cent shall be finer than 2 mm. After being placed and washed (as specified) and the fine sand on top scraped off and removed and the sand rewashed, the top two inches shall have an effective size between 0.40 and 0.50 mm. and not more than 1 per cent shall be finer than 0.25 mm. The diameters of the sand grains shall be computed as the diameters of spheres of equal volumes and all percentages shall be calculated by weight.

In a private communication, May, 1924, the Baltimore Water Department states that with new work they would use a little coarser sand, and expect in that way to get better.

Washington, D. C.:

> Sand shall be clean river, beach, or bank sand, either sharp or rounded, entirely free from clay, dust or organic impurities.
>
> Not more than 0.5 per cent shall be less than 0.13 mm.; not more than 8 per cent less than 0.26 mm. At least 7 per cent shall be less than 0.34 mm.; at least 70 per cent less than 0.83; at least 90 per cent less than 2.1 mm. No particle shall be less than 5 mm. diameter. The sand shall not contain more than 2 per cent of lime and magnesia calculated as carbonate.

Springfield, Mass., and Toronto, Ont.:

> The general specifications are the same as those for Washington. Size limits are as follows: The effective size shall not be less than 0.25 mm. nor more than 0.35 mm. The uniformity coefficient shall not be less than 3.0. The sand shall be free from dust and shall not contain more than 1 per cent finer than 0.13 mm. and entirely free from all particles over 5 mm.

A Missouri plant prepares its sand to the following specifications: Effective size not less than 0.40 nor more than 0.50 mm. and uniformity coefficient not greater than 1.65. Not more than 0.25 per cent shall be finer than 0.25 mm. At least 95 per cent shall be finer than 1.2 mm.

Sources of Supply

Compared with building sand, the production of filter sand is small and requires more careful preparation and extensive plant. A much better price is obtained than for the ordinary grades of sand, and, in consequence, the points of production are more widely scattered and the sand is sometimes shipped long distances.

The chief producers are in New Jersey, North Carolina, Illinois, Minnesota and Missouri, but any good sand bed can produce suitable filter sand, if it can be washed clean and if it contains enough grains of the required size to warrant their separation from the rest of the sand. Where the coarser grades of sand-blast sand are produced, the finer material is often prepared for filter sand. Also, the finer grades of sand-blast sand[†] may be used for filter sand if prepared with proper uniformity.

Methods of Mining

Filter sand may be prepared from ocean beaches, lake deposits, river bars, sand banks and soft sandstone, and the method of excavation depends largely on the nature of the deposit.

Where beach sand is used, the excavation is above high tide, so floating dredges are not feasible. Also, the area excavated usually has considerable horizontal extent so that excavating machines are best mounted on railroad track paralleling the direction of the beach. Locomotive cranes with clam-shell buckets make about the most efficient equipment; they have a wide reach and are more suited to the comparatively shallow excavations than steam shovels. The sand is conveyed to the washing and screening plant, preferably in side-dump cars drawn by steam or gasoline locomotive.

Sand in lake shores and bottoms and river bars is commonly excavated with dredging pumps mounted on barges, which are very mobile and efficient units. Sand can be pumped from any desired part of the bed, and enough water is at the same time pumped for washing or at least most of the washing. The mixture of sand and water is also conveyed to the plant through pipe lines in the same operation, within reasonable distances, and the action of the pump impellers tends to break up any clay lumps and facilitate washing. If the sand is to be conveyed some distance in cars, clamshell dredges standing on the bank of the lake and loading into cars alongside are sometimes used, as the power cost is less than for a dredge pump.

[†] Weigel, W. M., Sand-blast Sand, Serial 2615, Bureau of Mines, June, 1923.

When an artificial pond can be maintained, floating dredges are often the most efficient means of excavating the sand from what would otherwise be dry banks. If stripping of overburden is necessary, it is done by hand, scrapers, or steam shovel and the overburden hauled away in wagons or motor trucks. Sometimes the overburden is back-filled into the excavation. The floating dredges have steam, electric or oil engines, depending on which form of power is cheapest and best suited to the conditions.

Dry sand banks are mined with steam shovels if the plant capacity is sufficient to warrant their use, otherwise the cars or wagons are loaded by hand. Practically all regular producers of filter sand, however, have operations large enough to warrant the use of mechanical excavators.

Soft, friable sandstone constitutes most of the source of filter sand in the Mississippi Valley district. This sand is characterized by uniformly rounded grains, in this way differing from the angular to irregular-surfaced grains from lakes and banks. Some river sand also is mined in this territory.‡

Preparation

Preparation of filter sand involves washing or screening and usually a combination of both. Very few sands are clean enough without washing. These processes have been outlined in the report on sand-blast sand mentioned above, as some firms produce both sandblast and filter sand from the same bed or bank.

For filter sand the specification as to size and uniformity is rigid, so that careful screening or sizing is essential. In some instances, the sand is rescreened to insure the removal of fines.

Sizing by screens is almost universal, but where an ample water-supply is available, it would seem that hydraulic classification should give a suitable product, as all grains are of the same specific gravity and roughly of the same shape. It is admitted that more careful supervision would be needed than in sizing by screens, but that should be more than offset by lower first cost or greater capacity, and the washing and sizing would be performed in one operation. The sand originally used for the Washington, D. C., filtration plant was prepared by combined screening and hydraulic classification.§

The sand bank used contained considerable clay in the form of lumps and seams that could not be rejected in mining, making removal of the clay necessary. The sand from the bank was first dumped through a coarse grating to remove the larger clay lumps. This was followed by a revolving screen with 2-inch openings. The sand then passed through a revolving screen with 4-mm. openings in which jets of water played. The water and solids passing through this screen flowed to pug mills, which broke up and pulverized the remaining clay lumps. An excess of water here overflowed and removed a good portion of the clay. The sand was drawn out near the bottom. The pug mill was followed by the washers, which were long boxes with sloping bottoms, the feed entering at the shallow end. Water-supply pipes near the bottom had perforations pointing downward. The overflow of clay and water was removed by a central trough. The sand, after being separated from the clay by the combined horizontal and upward currents of water, was drawn off at the bottom of the deeper end of the washer. The capacity was stated to be about 1 cubic yard per hour per square foot of box area.

Shipment and Prices

Shipment is usually made in carload lots in box cars. Considerable business is, however, done in less than carloads to small filtration plants to make up losses due to rewashing of the filters. In this case, the sand is shipped in bags.

Prices vary widely. In small lots in bags, prices of $10 to $12 per ton, f. o. b. shipping point, have been recently quoted. In car lots in bulk, the price range is from $4 to $8 per ton, f. o. b. shipping point, depending on location and degree of rigidity of specifications.

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‡ Dake, C. L., Sand and Gravel Resources of Missouri, Missouri Bureau of Geology and Mines, Vol. XV, 2nd Series, p. 78.

§ Hazen, Allen, and Hardy, E. D., Water Filtration at Washington, D. C., Trans. Am. Soc. Civil Eng., Vol. LVII, p. 326.

QUARANTINE FOR VENEREAL DISEASES UPHELD

The Commissioner of Health of Akron, Ohio, placed two venereally infected women under quarantine pursuant to authority contained in regulations adopted by the Public Health Council of the State Department of Health. In habeas corpus proceedings brought by the two women, the Supreme Court of Ohio held the regulations not to be violative of either the federal or the state constitution, but held them to be a proper exercise of the police power of the state.—Public Health Reports.

Los Angeles Making Scientific Study to Relieve Traffic Congestion

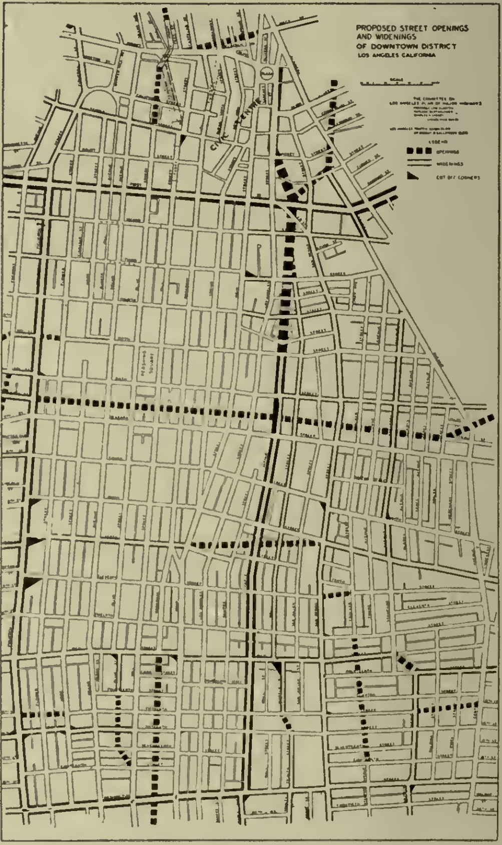
By Clarence R. Snethen

Los Angeles Traffic Commission

TRAFFIC experts usually concede that the traffic congestion in Los Angeles is the worst in the United States. A recent traffic check showed one street intersection—Figueroa and Santa Barbara—with a total of 40,222 autos crossing during 12 hours. There are at least twenty other corners in the city all having in excess of 30,000 cars for the same period.

The down-town business district has probably the least street area proportionately of any of the larger American cities, and is congested almost to the saturation point. These facts have been realized locally for some time. A little over two years ago the business interests and civic groups of the city organized the Traffic Commission of the City and County of Los Angeles to study the traffic situation and make recommendations for its relief.

This organization has employed a staff of trained technical men who have devoted their entire time to the scientific study of this city's intricate traffic problem. Their work has naturally been divided into three fields—public transportation, street development, and traffic regulations.



PROPOSED STREET OPENINGS AND WIDENINGS OF DOWN-TOWN DISTRICT, LOS ANGELES

(From report on "A Major Traffic Street Plan for Los Angeles, published July, 1924)

SECOND STREET, LOS ANGELES, LOOKING EAST FROM NEW TUNNEL NEARING COMPLETION

This narrow street is to be widened by arcading sidewalks under buildings

At the instance of the Traffic Commission the City Council recently retained Major R. J. Kelker of Chicago to make a survey of the transportation situation. He is now engaged in studying the transportation needs of the entire city and county, and his report outlining a rapid transit system will be ready the latter part of this year.

The Traffic Commission itself retained three of America's leading city planners—Frederick Law Olmsted of New York City, Harland

Bartholomew of St. Louis, and Charles H. Cheney of Los Angeles—to design a traffic street system. They have been studying the present streets and proposed improvements, and their report was published in July.

Upon the recommendation of the Traffic Commission, the City Council appropriated $10,000 to make a survey of the parking problem. This survey was made by a committee composed of representatives of the various business groups of the city. They recommended the complete elimination of parking on four north-and-south streets, and six east-and-west streets in the congested district, and established thirty-minute parking throughout the remainder of this district. As this article is written, their recommendations are being enacted into ordinances.

The Traffic Commission has retained Miller McClintock, of the Municipal Research Bureau of Harvard University, to make a study of the local traffic regulations and draft a model set of traffic laws which will be presented to the Council in September.

It has been felt that only by scientific study could any real solution be reached, and the Traffic Commission believes that with the completion of these various surveys it can enlist the support of the entire city in getting the recommendations adopted and put into effect.

Traffic Counts by Boy Scouts in Los Angeles

By Philip P. Sharples

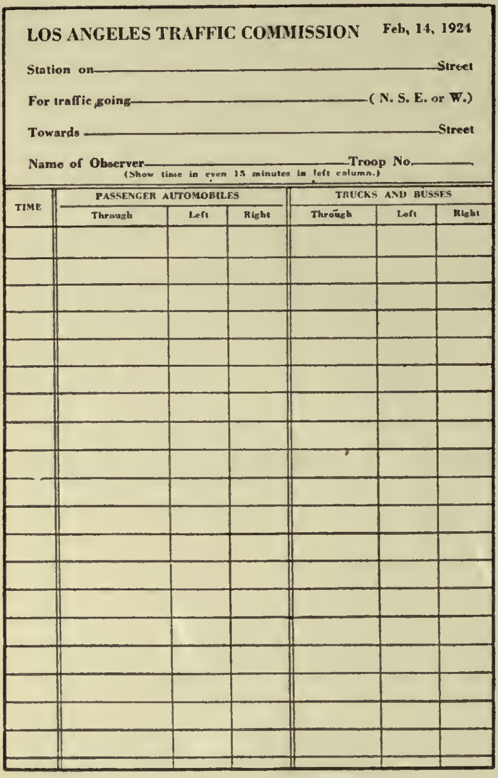
TRAFFIC congestion, traffic accidents and traffic annoyances in Los Angeles have forced to the fore all schemes for traffic relief. Messrs. Bartholomew, Cheney and Olmsted were asked by a committee of Los Angeles citizens, the Committee on Los Angeles Plan of Major Highways, a sub-committee of the Los Angeles Traffic Commission, to make a study of the plans already presented and make recommendations for relief.

A parking survey count made by paid workers showed 200,584 vehicles entering the business district of Los Angeles between 7 A. M. and 6 P. M., and 176,301 leaving; the balance being the numbers of vehicles still left in the business district at 6 P. M. minus the equivalent already there at 7 A. M. A count outside of this district was necessary to show the direction and volume of traffic at outlying points, in order to indicate the point or points at which traffic relief was most urgent.

Paving and topography cause the street traffic in Los Angeles to follow very definite routes, and it was possible to pick out a reasonable number of stations which, in addition to the cordon count around the business district made by the Parking Survey Board, would give a very comprehensive idea of the traffic movement in and about the city.

Various agencies were considered for making this count. Owing to the limited funds available for the work, volunteer workers were considered essential. The Boy Scouts were chosen on the ground that they had the proper kind of discipline, that they were drawn from every part of the city, and that they were greatly interested in civic matters. E. B. DeGroot, the Scout Executive for Los

TWO OF THE SCOUTS AT WORK



LOS ANGELES TRAFFIC COMMISSION Feb. 14, 1924

Station on ____________________ Street

For traffic going ____________________ (N. S. E. or W.)

Towards ____________________ Street

Name of Observer ____________________ Troop No. __________
(Show time in even 15 minutes in left column.)

TIME	PASSENGER AUTOMOBILES			TRUCKS AND BUSSES		
	Through	Left	Right	Through	Left	Right

CARD USED BY BOY SCOUTS

Angeles, gave his hearty support to the idea, and to his enthusiasm and power of kindling a response in his organization is largely due the success of the count. A. G. Seiler, Field Executive, had charge of the details.

The count was taken on Thursday, February 14, 1924, from 7 A. M. to 6.30 P. M. There is no virtue in the day, but preliminary studies had indicated that Thursday was the most nearly average traffic day of the week. The time of year is faulty in that daylight ceases at five-thirty, but it was imperative to have the results at as early a date as possible.

The whole city is interested in the traffic problem. For a population of a million in the city, there are at least 273,000 automobiles, while for the county with a population of a million and a half, there were 430,000 for the year 1923. It was not difficult at a dinner for the Boy Scout Masters, held at the Y. M. C. A., to sell them the idea of the count. Volunteers were asked for the count and every one present signed up, giving his name, his address, the Boy Scout troop headquarters and the number of scouts that could be counted on in his own troop. One hundred and twenty-five masters were on record with an average of ten boys from each of those troops.

The School Board was next interested in the count and proved as enthusiastic as the Scout organization. The Scouts were promised a day's leave of absence from school with a record of attendance, if they were reported by the Scout organization to be on duty on the count day. The permission of a parent or guardian to take part in the count was also required, and the Scout was required to report the permission to his school teacher the day before and get leave of absence for the count day. This scheme placed the responsibility for taking part in the work directly on the parent and obviated any cause for complaints. The parents and school teachers almost as a unit displayed hearty civic cooperation.

In the meantime, directions for taking the count had been prepared and printed, cards for taking the count made, badges provided and pencils cut into convenient lengths. Enough supplies for a corner were assembled in a stout manila envelope, together with a directed envelope for returning the cards to Scout Headquarters. Each Scout had a badge, a pencil, a copy of the directions and the leader took charge of the supply of cards and was, in fact, in command of that particular corner to which he was assigned. Each leader was required to have a watch.

Talks were given to the boys about the way of taking the count, time having previously been given them to study the directions. A large wall chart had been prepared to show the diagram of a corner and the possible variations from a four-way corner. Special diagrams had been prepared for places where the count was to be made on a straight-away stretch or on a three-way, five-way or six-way corner.

The boys, averaging about eleven years of age, showed a keen grasp of the directions and called for the elucidation of many points not apparent on a first reading of the directions. Boys asked what to do about counting taxicabs, asked whether a commercial number plate should be considered a truck, and asked how a car turning the corner and returning on the same street should be reckoned.

The morning of the count dawned clear and warm. The Scout office was open before daylight and calls began to come in at once. Some squads reported that their crews were not full or that boys could only give part time. All Scouts not otherwise assigned had been asked to report to headquarters, and by 7 o'clock a hundred reserve scouts were waiting. All deficiencies were filled by dispatching Scouts by car-line or auto. A systematic inspection was made by the headquarters staff of all stations twice during the day. The inspectors carried extra cards, extra printed directions and extra Scouts.

An examination of the cards naturally showed a great variation in workmanship. Few had failed to make their records clear and those that were obscure were cleared up by a study of the corner and the cards. Only two or three corners were rejected entirely as too incomplete to use.

As a check on the accuracy of the count, adjacent corners were carefully compared and in case of any discrepancy the cards were carefully gone over. In this way mistakes in sorting and tabulating were in several cases detected and the boys' work proved to be correct.

The tabulation was done on large sheets, with a ruling for each fifteen minutes during the counting time and vertical columns for each of the four stations and for passenger automobiles and trucks separately. This made a total of twenty-four columns for a standard corner.

The columns were totaled separately and the traffic in every direction from the corner for both trucks and passenger automobiles was figured separately. Cross footings gave the number of vehicles passing a station on the same side of the street and vertical footings gave the total vehicles passing on the opposite side of the street. The sum of the two gave the total traffic flow on the street and was entered on the traffic flow map. This map was constructed by plotting the corner counts as a cross on a map of the city drawn to a scale of 1,600 feet to the inch. Each arm of the cross was made a width to correspond to the traffic flow, allowing 50,000 vehicles to the inch in width. The adjacent corners were connected. The resulting diagram showed clearly the concentration points of traffic and indicated where relief was necessary to provide for abnormal flow, either by diverting into other channels or by widening and straightening existing streets.

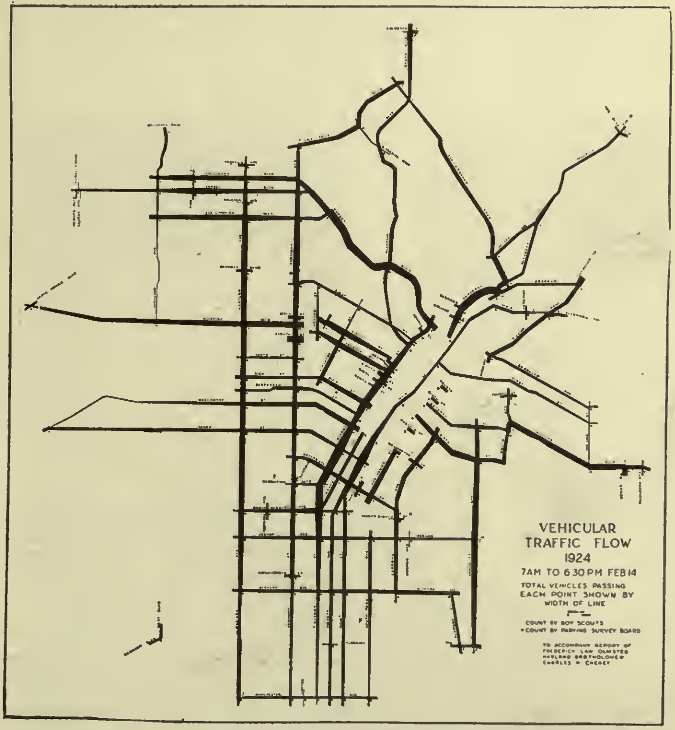
The traffic flow map must needs be studied with a thorough understanding of street paving widths. The heaviest traffic flow is not always where it would naturally be, but where it is forced by street widths, by street-car routes, by sub-business centers and other factors that reduce effective traffic width. As Prof. Arthur E. Johnson has so well pointed out in his studies on traffic capacities of the Baltimore-Washington road, an uninterrupted flow can pass one thousand vehicles per hour on each line of traffic and this number, owing to wider spacing, varying roughly as the square of the velocity, does not change within rather wide limits of speed.

The limiting capacity of streets lies largely in the interruptions to traffic flow. The traffic flow map shows the points where it is most necessary to study the interruptions and to provide for traffic control.

The data collected do not furnish a complete traffic survey, as it was thought inexpedient to burden the Boy Scouts with more than a rough classification of trucks and passenger cars. The ratio between trucks and passenger cars is about 1 to 10.

The cost of the count was substantially as follows: No cost of overhead or supervision is included, as these costs were absorbed either by the Boy Scout Headquarters or the Consulting Board general office expense.

Printing	$80.00
Boys' allowance @ 50c............	450.00


VEHICULAR TRAFFIC FLOW
1924
7AM TO 6 30 PM FEB 14
TOTAL VEHICLES PASSING EACH POINT SHOWN BY WIDTH OF LINE
COUNT BY BOY SCOUTS
• COUNT BY PARKING SURVEY BOARD
TO ACCOMPANY REPORT OF FREDERICK LAW OLMSTED HARLAND BARTHOLOMEW CHARLES H CHENEY

TRAFFIC MAP BASED ON COUNTS BY THE BOY SCOUTS AND THE PARKING SURVEY BOARD

Dinner and luncheon................	220.00
Tabulating	428.00
Taxies and autos....................	75.00
	$1,253.00

The count has proved of inestimable value in the studies of the Consulting Board. Without it, the direction and volume of traffic would have been with difficulty realized. The accuracy and dependability of the work of the Boy Scouts have reflected great credit on the boys and their training.

ACKNOWLEDGMENT.—The foregoing statement is elaborated from a report on "A Major Traffic Street Plan for Los Angeles," published July, 1924, and listed on page 275 of this issue of THE AMERICAN CITY. We are indebted to Mr. Sharples for the additional data and for the accompanying illustrations, two of which do not appear in the published report.

Down-Town Traffic Regulations

Some Rules and Improvements Which Have Helped to Reduce Congestion in the Down-Town Streets of Los Angeles

By Cleveland Heath

Captain, Traffic Division, Los Angeles Police Department

1. Parking is prohibited in certain streets from 4:00 to 6:15 p. m., and we favor a similar provision from 7:00 to 11:00 a. m.

2. We have eliminated left turns at twelve of our busiest intersections from 9:00 a. m. to 6:15 p. m.

3. Loading zones have been created in each block for the use of commercial vehicles.

4. No vehicle is allowed to back to the curb from 9:00 a. m. until 6:15 p. m.

5. All vehicles must park with right wheels within one foot of the curb.

6. Alleys are restricted to one-way travel and no parking, except while actually loading and unloading.

7. Parking is prohibited in front of theaters, hospitals, hotels, police stations, fire-houses post-offices, sidewalk elevators, private driveways, and street-car loading zones.

8. We have a 45-minute parking limit from 7:00 a. m. to 6:15 p. m.

9. We have a synchronized traffic signal on thirty-one corners, which is operating successfully. These signals are a combination of semaphore, lights, and bells, and are controlled from one station. They are very flexible, and the intervals may be made to suit almost any condition; they may be operated manually, or any part of the system may be cut out. We are contemplating eliminating the lights during the day and the semaphores at night. The signals are in use from 7:00 a. m. to 9:00 p. m. The cost of operation is small. They are manufactured by the Acme Traffic Signal Co. of Los Angeles.

10. We are also getting relief through the city's program of opening and widening streets. Within the past few months, Fifth Street has been cut through the hill on the west. New arteries to the south have been provided by the opening of Hill Street. It is now proposed to cut Broadway through to the south. Work will start soon on new viaducts over the Santa Fe and Union Pacific tracks and the river on the east. Tenth Street is now being opened and widened to 100 feet, and will extend entirely across the city.

SYNCHRONIZED TRAFFIC SIGNALS

City of Cohoes to Build Houses for Sale to Its Citizens

By Daniel J. Cosgro

Mayor, Cohoes, N. Y.

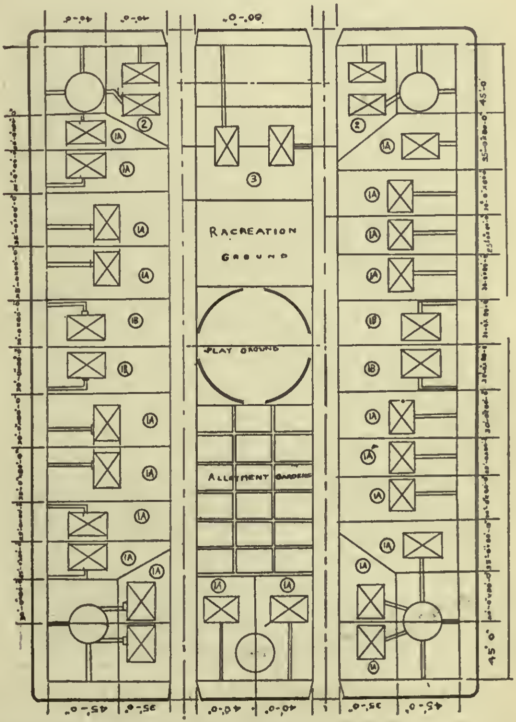
THE city of Cohoes is about to erect a number of houses for sale to residents of the city. The program was entered upon because of the serious shortage of houses in this neighborhood. The crowding of families, it seems to us, will inevitably result in injury to the health of the people and might cause the spread of disease; therefore, under the police power and by virtue of our interpretation of the new home rule act, we believe we have authority to erect a sufficient number of houses to relieve the emergency.

We have to meet the local problem of getting the price of the houses down within the earning capacity of the average wage-earner in this city. The cost of the houses should be from $2,000 to $3,500. Above that the figures would be prohibitive to the average wage-earner who makes from $25 to $35 per week.

The city has taken an option on thirty acres of land in an accessible part of the city and proposes to develop it into a community with ideal arrangements. The lots will be 40 x 90 feet, and for every thirty or forty families we have provided a community recreation center, with playgrounds, tennis courts, etc. The price we are to pay for the land will enable us to deliver the 40- x 90-foot lots at about $50 each. The soil is soft loam. It is all level ground and close by the termination of the present sewer and water systems. The cellars can be excavated at a cost of from $25 to $50. The cost of installing water-mains and sewer systems will be minimized by the short distance of the extension. Water should cost $30 per lot and sewers also $30 per lot. The houses, the plans of which we have already selected, range from a modest bungalow with living room, bath and two bedrooms, to a house with living and dining room and bath on the first floor and four bedrooms on the second floor. The smaller houses can be sold to the purchasers for $2,000 and the larger ones for $3,500.

The city does not propose to go into the real estate business, nor to loan money on bond and mortgage. The prospective purchaser will apply to a bank or building and loan association and arrange for a loan with which he can purchase the building from the city at cost. Inasmuch as the average cost of house building in the customary way in this locality is from $5,000 to $7,000, we expect no difficulty in closing out the houses above described at the low figures mentioned above. The city has authorized a bond issue of $150,000 to finance the enterprise. We do not, however, expect to have to actually sell the bonds. We expect to borrow from the banks on temporary certificates, and pay back the certificates from the sale of the houses. If we decide to sell any of the bonds, we shall use the proceeds only as a means of putting up the houses and turning the money over. That is, as we sell the first $50,000 worth of houses and receive the cash, we shall build another $50,000 worth of houses, and so on in a continuous turnover, until the emergency is relieved.

It will be noticed that we keep our costs down in several ways: First, by buying a



ARRANGEMENT OF HOUSES IN BLOCKS, CITY OF COHOES HOUSING PROJECT large plot of ground and charging up the lots at cost we eliminate the land speculator's value. Second, by picking a site made up of soft loam, we reach a very low cost for excavation. Third, by letting contracts for a number of houses, we get a lower figure. Fourth, by having the city supply the money at cost, we eliminate entirely the profit of financing by outside investors, which is usually a substantial sum. Another advantage will be that these houses, when erected and sold, will become tax-paying property; thus, instead of the project being a burden or expense to the city, it will help to relieve the housing shortage and will be at the same time a revenue producing project of benefit to every taxpayer.

In all this work we have had great assistance from our young City Engineer, Andrew H. Thompson, without whose skilled knowledge and devotion to the project perhaps we should not have been able to arrive at such a favorable consummation.

A Civic Association's "Know Your Town" Exhibit

By Leroy A. Mershon

President, Westfield Civic Association

THE "Know Your Town" exhibit, recently conducted in Westfield, N. J., under the auspices of the Westfield Civic Association, brought before the people in an impressive way the aims and accomplishments of the various municipal departments in their efforts to serve the community. The Fire Department headquarters were chosen as the best location for the exhibit, and during the six days that it remained open, about 10,000 visitors were recorded.

A SECTION OF THE BOARD OF HEALTH'S EXHIBIT

The photographs reproduced on this and the next page are by courtesy of Theo. J. Hintz

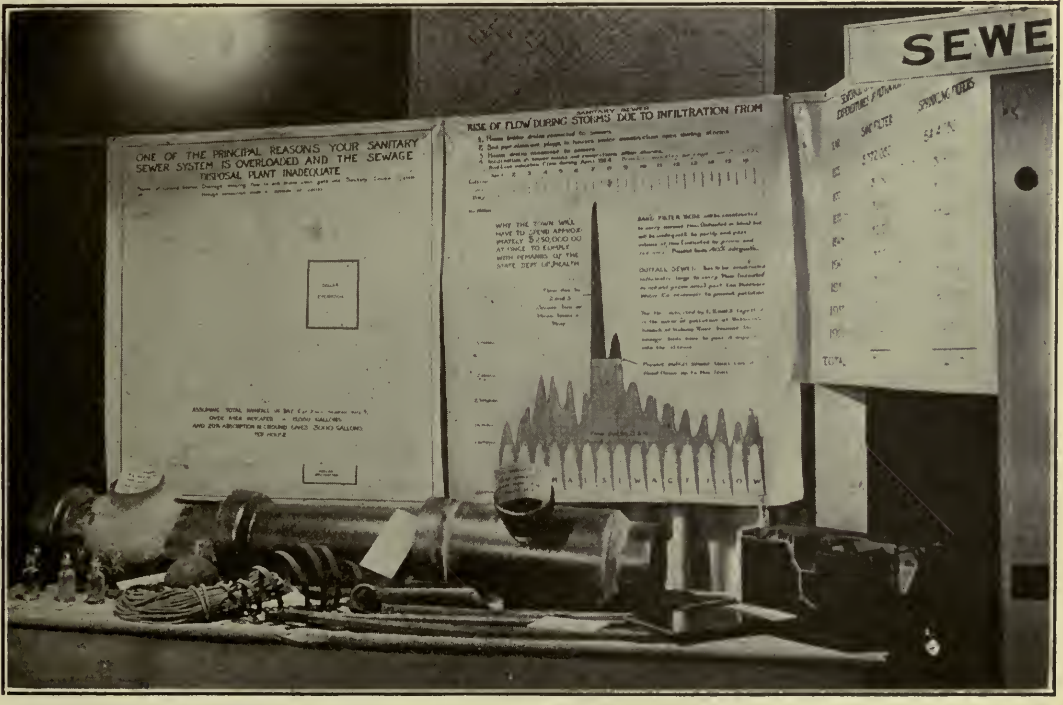
Charts were displayed which showed the organization of the town government, the growth of the town in the past ten years, and the increase in the number of automobiles owned by the people of Westfield. Money bags of various sizes depicted the relative amounts of money taken in by the Collector each year from 1913 to 1923, and diagrams visualized the comparison between the expenditures of ten years ago and those of the present time. At the entrance to the booth stood an obelisk, painted in various colors to show how Westfield's tax rate of $3.41 per $100 valuation will be divided to meet the 1924 town expenses.

In the Roads and Sewers exhibit, prepared by the Town Engineering Department, were displayed a model of the Imhoff settling tank in use by the town, a section of sewer pipe showing the comparison between old and new methods of making sewer connections, and such other samples of the materials and equipment used by the department as the limited space of the booth allowed. The steps necessary to secure road and sewer improvements were shown by diagrams and a map of the existing sewer system was also on display.

The large booth of the Police Department attracted a steady throng of visitors throughout the week. Realizing that working models add considerably to the popular interest, an elaborate model of the Gamewell police signal

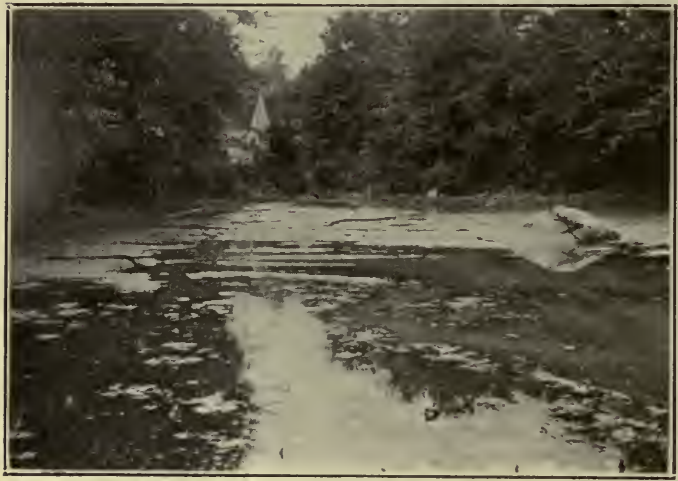
THE POLICE DEPARTMENT'S EXHIBIT

A special feature was a working model of the recently installed police signal system


SEWE
ONE OF THE PRINCIPAL REASONS YOUR SANITARY SEWER SYSTEM IS OVERLOADED AND THE SEWAGE DISPOSAL PLANT INADEQUATE
RISE OF FLOW DURING STORMS DUE TO INFILTRATION FROM
WHY THE TOWN WILL HAVE TO SPEND APPROXIMATELY $250,000.00 AT ONCE TO COMPLY WITH DEMANDS OF THE STATE DEPT OF HEALTH

DIAGRAMS PREPARED BY THE TOWN ENGINEERING DEPARTMENT SHOWING WHY SANITARY SEWERS ARE OVERLOADED AND THE SEWAGE DISPOSAL PLANT INADEQUATE

The central diagram shows the normal sewage flow in white at the bottom; the middle gray section is additional flow during storms, caused by house drains that are connected to sewers and by infiltration into sewer mains and connections after storms; and the two black peaks show the storm flow increase caused by house leader drains connected to sewers and through open pipe clean-out plugs in houses under construction system recently installed by the town, including one of the regulation police telegraph boxes used in the system, was put in operation. Officers were on hand to explain the details of the apparatus, and many visitors were shown just how patrolmen could be summoned to their particular localities in time of need. The Police Department fingerprint equipment was also put in operation, and a number of people availed themselves of the opportunity to have their identification record made by this method.



CLARK'S POND AND PECKHAM'S DUMP (BEFORE)

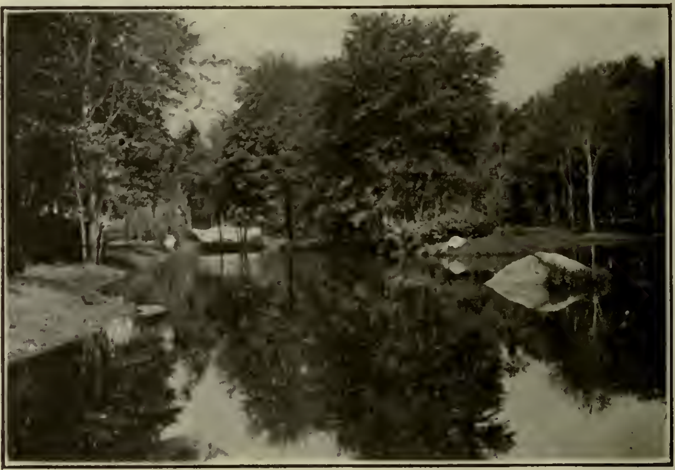
The educational exhibit, covering all phases of the public school activities in Westfield, proved one of the main points of interest, particularly to the parents and children visiting the exhibition. The walls of the booth were lined with photographs of school buildings and classes, specimens of the work done by the pupils, and diagrams showing the growth and developments of the various school departments in recent years. The manual training classes put on exhibition samples of their work in carpentry, wood turning, bench work, hammered copper work, mechanical drawing and printing.

The District Nurse in uniform explained her work and displayed some of the useful things which she loans to those in temporary need, such as crutches and carrying and wheel chairs, as well as the dressings she has obtained for her use.

Next to her exhibit was that of the Children's Country Home, a Westfield charity, which provides a convalescent home for tubercular bone condition after operation. Casts and braces formerly used, but discarded by recovery, made an interesting exhibit—with pictures of the children at work and play during their convalescence.

The parks and recreational facilities of Westfield were shown to good advantage by a fine collection of photographs and maps. Several photographs of Clark's Pond and Peckham's dump as they were less than ten years ago displayed beside views of the same spots as they now appear in Mindowaskin Park, were convincing illustrations of what this community has accomplished along the line of city beautification.

The Exhibit Committee was fortunate in securing an excellent model of a section of the New York-New Jersey Vehicular Tunnel, now under construction. The model, which was about twelve feet in length, electrically illuminated to show the interior of the tunnel, demonstrated the kinds of material used in the work and also showed the details of the ventilation system which is being installed. To present a clear idea of the actual size of the tunnel, several miniature automobiles, made to scale, were placed in the driveways of the model.



MINDOWASKIN PARK (AFTER)

The activities of the Board of Health were interestingly outlined by charts showing the results of milk inspection, inspection and care of dumps, vital statistics and contagious diseases in Westfield covering the past five years, etc. A model of plumbing underneath a bathroom floor was on view, and also samples of cellar clean-outs demonstrating how they should be cared for. Motion pictures of a model dairy in operation were presented.

In the historical display of the Fire Department, Westfield's first fire engine, "The Little Giant," and other relics of earlier days, standing beside the modern motor apparatus with which the Department is now equipped, showed clearly the great progress that has been made in fire-fighting apparatus.

A municipal exhibit of this kind cannot fail to give the people of the community a clearer conception of the scope and function of the various branches of the city's work, and through this broader knowledge of what is actually being accomplished will be aroused a greater pride and interest in civic affairs.

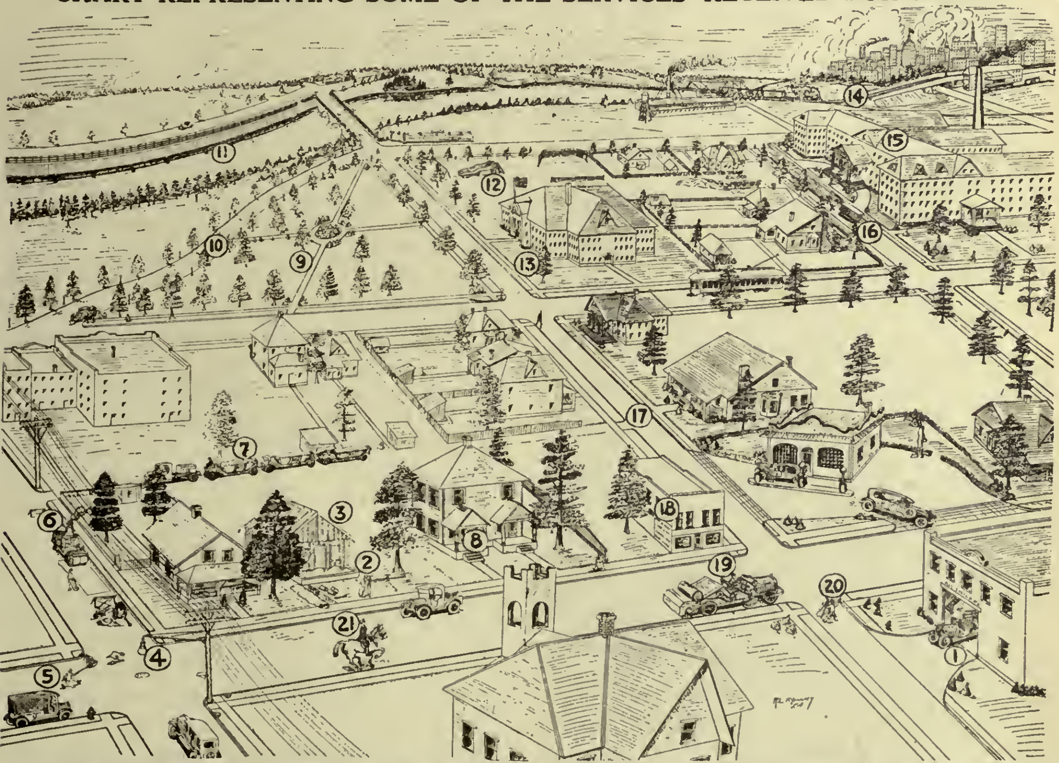
Visualizing a City's Service to Its Citizens

THE accompanying chart, in considerably larger size, occupies two facing pages in the recently published Report of the Business Affairs of the City of Indianapolis, by City Attorney James M. Ogden. In addition to this visualization of the city's principal services to its citizens, the pamphlet goes into some detail as to the activities of the city government and presents the following analysis of the distribution of the tax dollar for the year 1923:

Track Elevation	$ .007
Park General	.062
Recreation	.011
Health General	.082
School Health	.003
Park District Bond Fund	.034
War Memorial Bonds	.011
Street Resurfacing	.004
Improvement Sinking Fund	.003
Sanitary Maintenance	.050
Sanitary Construction	.097
Sanitary Bonds	.011
Fire Pension	.008
Police Pension	.009
General City Sinking	.026
Flood Prevention Sinking	.017
Tuberculosis	.005
Erecting Hospital	.036
Board of Public Safety	.255
General Fund—	
Board of Public Works	.163
Purchasing Department	.002
City Plan Commission	.002
Law Department	.004
Finance Department	.098
	$1.000

A copy of the pamphlet will be sent to any reader of THE AMERICAN CITY on application to Mr. Ogden.

CHART REPRESENTING SOME OF THE SERVICES RECEIVED FOR TAXES



KEY TO CHART 1. Fire Protection. 2. Plumbing Inspection. 3. Building, Wiring and Sanitary Inspection. 4. Street Lighting. 5. Dog Pound. 6. Street Repairing. 7. Ash and Garbage Collection. 8. Protection from Disease. 9. Pleasure Parks. 10. Boulevards. 11. Flood Prevention. 12. Playgrounds and Recreation. 13. Schools. 14. Track Elevation. 15. Hospitals. 16. Sewer Maintenance. 17. Street Resurfacing. 18. Weights and Measures and Meat Inspection. 19. Street Cleaning. 20. Civil Engineering. 21. Police Protection.

Trolley or Bus in the Small City?

A Problem Largely Dependent on Paving Charges

By Walter Jackson

Fare and Bus Consultant, Mt. Vernon, N. Y.

WHEN every week brings the news of another small-city electric railway, or at least a portion thereof, abandoned in favor of the motor-bus, we cannot wonder at the laymen's impression that the trolley car is becoming "as one with Nineveh and Tyre."

Is this all true, partly true, or not true at all?

A blanket answer cannot be given, but we can discuss particular instances and draw a fairly clear conclusion from each, to enable the reader to analyze his own situation with a better understanding of the pros and cons.

Before taking up individual cases, let us consider a few general features that apply more or less to any car *vs.* bus problem.

The Permanent Advantages of the Bus

1. It is not confined to a track and therefore may go around a slower or stalled vehicle.
2. Its freedom from a fixed route permits the still greater flexibility of using other streets, whether to escape a parade or a fire, or serve an off-side traffic magnet like a circus.
3. Its ability to take on and discharge passengers at the curb draws patronage by relieving the patron from the hazard of waiting in the street.
4. Its low first cost and transferability to other places permit the transportation concern to test out different streets and any desired length along them as feelers for new business.
5. It uses the same highway as other vehicles, with no demand for a special roadway nor obstructive poles and wires.
6. It affords greater safety and punctuality as contrasted with the single-track operation common in cities of below 50,000 inhabitants.
7. A much smaller staff is needed than in small cities with railways requiring power, track and line engineers beside car equipment men.

The Temporary Advantages of the Bus

1. It is a novelty—and the American people like new things.
2. Communities encourage its coming, even to the point of free waiting-rooms, while opposing railway improvements.
3. The bus operators, as a class, have any misdeeds in public relations ahead of instead of behind them.
4. The bus operator does not pay as heavy a tax as the longer-established utility.

Present Disadvantages of the Bus

1. It is not as spacious as the electric car, particularly in aisle and seat widths and in headroom.
2. It cannot carry a standing load twice a day without materially shortening its useful life, so is not satisfactory for a vehicle-for-vehicle replacement on lines with heavy peaks.
3. It is not so well ventilated, heated or lighted as the odorless trolley with unlimited power supply.
4. It is not so comfortable and free from anti-reading vibrations as a good car on smooth track.
5. It offers less assurance of unbroken service to the public in the event of poor revenue than does an electric railway, which cannot fold its tents in the night and silently steal away.

First Case Points to Retention of Trolley

The foregoing classifications do not attempt to cover all of the possibilities, but enough are given to show what one must consider in a general survey. Our next purpose is to examine actual cases where the bus is being considered or has already been installed. The upshot of these specific examples will tend to prove that one of the greatest advantages to the motor-bus operator in city service is the temporary one of freedom from paving charges and other special taxes that have grown onto the trolley as barnacles on an idle hull.

Case No. 1 is a trolley route which passes through two adjoining communities. The line is well patronized in the larger community, but does much less business in the smaller and less-developed place of 7,000 inhabitants. The smaller town is now entering upon a paving program which would cost the railway possibly $50,000 for paving assessment alone, regardless of the cost of new track structure and rail.

The easiest way out of the situation would be to substitute a shuttle bus under state license and to charge even a higher rate of fare than that permitted at present. The change from through service, however, would be a great inconvenience to the passengers and an undoubted injury to the town. It would also be an injury to the transportation company in the expected event of an extension of the present trackway to a third community.

ONE OF FOURTEEN GMC BUSSES PURCHASED BY THE WATERTOWN (N. Y.) TRANSPORTATION COMPANY OVER A PERIOD OF SIX YEARS

Now the obvious thing here is for the town to waive the paving charge. It certainly would not receive an equivalent amount from the bus operator, whoever he might be; and just as certainly the railway has no intention of continuing to pay for "everybody's highway."

Second Case Shows Place for Bus and Car

Case No. 2 is a railway in a city of 30,000 inhabitants. The municipality is anxious to go through with a paving program which, for its first portion, would extract a mere $120,000 from the railway. In this case, the city railway forms part of a larger system, so that it has no such high salary overhead as would be the case if it were an independent road with a diversity of engineering talent, small, inefficient power-plant and so on.

An analysis of the routes showed that on the basis of equal taxation, it would be better to run busses on two thin-traffic lines because of the desirability of change in routing and extensions. It would also be desirable to install busses on an entirely new route to develop the traffic possibilities.

On the other hand, one route does such good business that the most desirable solution would be to substitute double-truck one-man cars in place of antiquated single-truck two-man cars. It would be impossible to handle the peaks on this route without using twice as many busses as cars of the proposed type. Furthermore, a portion of the present route is on right of way with an attractive waiting-platform in place, whereas the busses would not be accessible at this locality unless the city most obligingly would pave the still-theoretical highways.

Here is another example where the waiving of the paving charge would enable the transportation company to give the public whatever was the best for all concerned. Conceive the disappointment of the municipality when it learns that it will be "dished" out of the $120,000. Why not make the best of it, so long as the railway can now escape the anachronism of paying for something which others, *not itself,* wear out.

One Company Finds a 5-Cent Bus Fare Impossible for a Scattered Population

Case No. 3 is of exceptional interest because of its relation to the fare question. In a scattered city of 30,000 the original trolley routes had been laid out by a land development company. The desire to escape excessive prices for real estate along these routes perhaps accounts for the fact that the town chose to grow in a contrary direction, and this tendency was promoted, of course, by the personal automobile. The present owners of the property, a syndicate which was one of the pioneer bus operators, decided to rebuild almost all of the system and reroute with motor-busses.

One condition imposed by the city was that the operators should try a 5-cent fare in place of the average 6½ cent fare on the trolleys. Although the average length of haul in this city is less than 1½ miles, the company after a year's trial was forced to return to the trolley fare. The cost of operation and return on investment could not be met on a 5-cent fare by an organized company compelled to operate unfailingly and to high standards of service, although independent jitneurs working 12 hours a day for themselves and with any kind of vehicle might have made a go of it. While the bus substitution was the right policy, the city was wrong in expecting that the increase in traffic and decrease in costs would justify a 5-cent fare.

ONE OF SIX AUTOCAR BUSSES USED BY THE SCHOOL DEPARTMENT OF LOWER MERION TOWNSHIP, PA., FOR CARRYING ABOUT 150 CHILDREN TO AND FROM SCHOOL EVERY DAY

One Modern Bus System That Costs Less and Earns More Than the Trolley

Case No. 4 deals with a city of 33,000 where all the local trolley routes have been superseded by busses under the same control. In this instance the gain has been twofold. First, the novelty and easier accessibility of the busses appear to account for a 10 per cent increase in patronage. Second, the simpler organization (substation shut down, for example) has permitted a lower operating expense. In this example of an independent company, we have one where the "bussification" was 100 per cent justified.

Motor Bus Charges More Fare While City Gets Practically No Taxes

Case No. 6 was that of a community of 22,000 which lost its electric railway service because it would not meet the then deficit of $20,000 a year. The haphazard jitney successors were soon followed by an organized bus company. This company undoubtedly gives better service than did the electric railway in the first year of its reorganization. It is to be observed, however, that the only fees which the operator pays are nominal property taxes and $10 per bus per annum. Nowadays the community does all the paving at its own expense.

At the time the electric railway quit, the fare was 10 cents flat, with no cheaper tickets. To-day the same railway on other divisions has ticket rates varying from 12 to 20 for a dollar, according to the cost of service in each district. The successor bus company in the abandoned territory charges the same basic fare of 10 cents, and has lately had to answer a complaint as to excessive fares on a cross-country extension which never paid any of its bus predecessors at either higher or lower rates.

Had this particular community shown the same patience during the reorganization as others, it would doubtless have received better trolley service and probably enjoyed a somewhat lower scale of fares than is given under a bus company which goes almost scot-free as to taxes.

A 25-PASSENGER PAY-ENTER GARFORD BUS, OPERATED BETWEEN WILLIAMSPORT AND BLOSSBURG, PA.

Municipality May Regret Present Discrimination

The foregoing cases may be numerous and diversified enough to show what points the municipal official must consider in this question of car *vs.* bus. The time is almost by when electric railways refuse to recognize that the bus should be an integral part of their operation. When an electric railway can show that it cannot afford to pay the taxes demanded, the wise city official will approve whatever form of propulsion offers the most service for the money with the least annoyance to the public. One thing is certain—that if a municipality must have the amounts that formerly came from the electric railway, it will seek to get them out of the successor bus company. After all, the paving and bridge charges paid by many railways are not really an equivalent for some expense made by the community but are, frankly, a tax on the privilege of a monopoly in public utility transportation.

Therefore, the time must come when both forms of propulsion will be judged on the same basis. In the end, the Tax Collector, like Time, will be served!

SEVEN OF THESE LATEST TYPE MACK LOW CITY BUSSES ARE HANDLING THE TRANSPORTATION REQUIREMENTS FOR THE CITY OF MIDDLETOWN, N. Y.

For an authoritative discussion of Public Utility Ownership and Regulation, see article under that title, by Delos F. Wilcox, in the 1924 *Municipal Index.*

Forward Steps in City and County

Thirty Towns Unite in Cooperative Fire-Fighting Program

Dallas, Tex.—A well-organized system of cooperation between the large city and the surrounding smaller communities in the matter of fire protection service has been worked out in District 17, Dallas. In December, 1921, the fire chiefs of all towns in this District, which covers all of Dallas County in addition to some communities in adjoining counties—about thirty towns in all—organized a mutual association for the purpose of formulating a cooperative fire-fighting program. Since that time, meetings of this body have been held once every three months in some town in the district, with the fire chief of the convention town presiding. In connection with these meetings a thorough inspection is made of fire protection conditions in the convention town, and at regular intervals fire prevention lectures are given in the public schools.

Through the efforts of the Fire Chief of the city of Dallas, an arrangement was made between the city and the county whereby the county bought a 750-gallon LaFrance pumping engine, to be manned and operated by the Dallas Fire Department and sent out in response to calls from any community in the District. The installation of interchangeable hose couplings has been perfected throughout the District, and a running card schedule, specifying the calls to which each town shall respond, has been adopted. This schedule has been so planned that each town goes to the assistance of its nearest neighbor, and in the case of a town which has but one piece of apparatus, additional departments are scheduled to assist. The city of Dallas is ready to respond in all cases.

Since the establishment of this system of cooperation, it has been gratifying to note the increased interest in fire protection on the part of the smaller towns. Many of them have installed water-supply systems.

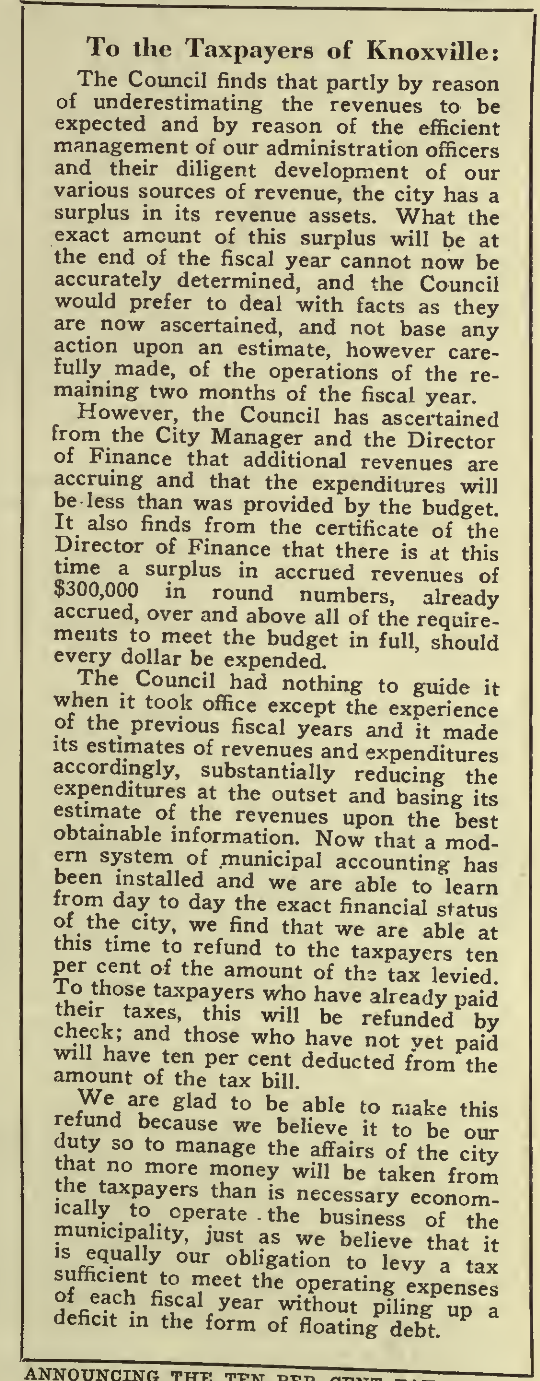
One of our aims is to secure the passage by the Legislature of a bill controlling the over-insurance problem now existing in Texas, and to this end a committee of the association of District 17 has been appointed to cooperate with the Legislative Committee of the State Firemen's Association in the matter.

T. A. MYERS,
Chief, Dallas Fire Department.

A Ten Per Cent Tax Refund

Knoxville, Tenn.—A ten per cent tax refund has been voted by the Council of the city of Knoxville to taxpayers on account of the tax levy of the current year. This has the effect of reducing the tax rate from $2.44 to $2.196.

When the city manager charter came into effect at the beginning of Knoxville's fiscal year, October 1, 1923, the Council was faced with the immediate task of preparing a budget. It had only the experience of former administrations to guide it. Taking the expenditures of the previous fiscal year as a basis, the Council made up a budget which involved a reduction of $500,000 in expenditures. Then they estimated the revenues and



To the Taxpayers of Knoxville:

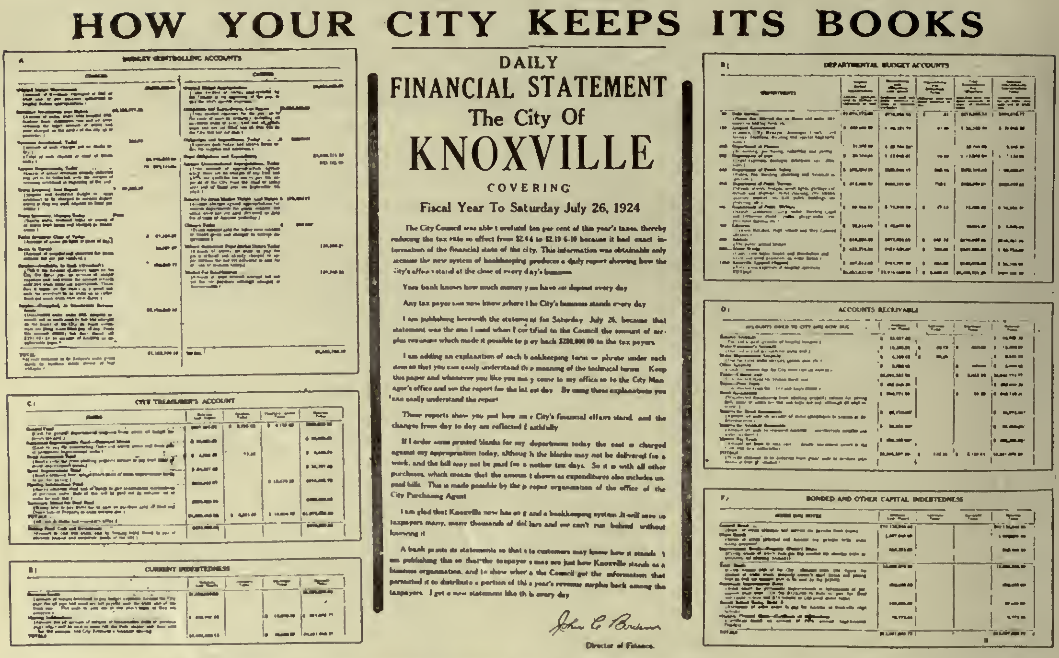
The Council finds that partly by reason of underestimating the revenues to be expected and by reason of the efficient management of our administration officers and their diligent development of our various sources of revenue, the city has a surplus in its revenue assets. What the exact amount of this surplus will be at the end of the fiscal year cannot now be accurately determined, and the Council would prefer to deal with facts as they are now ascertained, and not base any action upon an estimate, however carefully made, of the operations of the remaining two months of the fiscal year.

However, the Council has ascertained from the City Manager and the Director of Finance that additional revenues are accruing and that the expenditures will be less than was provided by the budget. It also finds from the certificate of the Director of Finance that there is at this time a surplus in accrued revenues of $300,000 in round numbers, already accrued, over and above all of the requirements to meet the budget in full, should every dollar be expended.

The Council had nothing to guide it when it took office except the experience of the previous fiscal years and it made its estimates of revenues and expenditures accordingly, substantially reducing the expenditures at the outset and basing its estimate of the revenues upon the best obtainable information. Now that a modern system of municipal accounting has been installed and we are able to learn from day to day the exact financial status of the city, we find that we are able at this time to refund to the taxpayers ten per cent of the amount of the tax levied. To those taxpayers who have already paid their taxes, this will be refunded by check; and those who have not yet paid will have ten per cent deducted from the amount of the tax bill.

We are glad to be able to make this refund because we believe it to be our duty so to manage the affairs of the city that no more money will be taken from the taxpayers than is necessary economically to operate the business of the municipality, just as we believe that it is equally our obligation to levy a tax sufficient to meet the operating expenses of each fiscal year without piling up a deficit in the form of floating debt.

ANNOUNCING THE TEN PER CENT TAX REFUND TO THE PEOPLE OF KNOXVILLE


CITY TREASURER'S ACCOUNT
CURRENT INDEBTEDNESS
DEPARTMENTAL BUDGET ACCOUNTS
ACCOUNTS RECEIVABLE
BONDED AND OTHER CAPITAL INDEBTEDNESS

HOW YOUR CITY KEEPS ITS BOOKS

DAILY
FINANCIAL STATEMENT
The City Of
KNOXVILLE
COVERING
Fiscal Year To Saturday July 26, 1924

The City Council was able to refund ten per cent of this year's taxes, thereby reducing the tax rate in effect from $2.44 to $2.19 6-10 because it had exact information of the financial state of the city. This information was obtainable only because the new system of bookkeeping produces a daily report showing how the City's affairs stand at the close of every day's business.

Your bank knows how much money you have on deposit every day.

Any tax payer can now know where the City's business stands every day.

I am publishing herewith the statement for Saturday, July 26, because that statement was the one I used when I certified to the Council the amount of surplus revenues which made it possible to pay back $200,000.00 to the tax payers.

I am adding an explanation of each bookkeeping term or phrase under each item so that you can easily understand the meaning of the technical terms. Keep this paper and whenever you like you may come to my office or to the City Manager's office and see the report for the latest day. By using these explanations you can easily understand the report.

These reports show you just how our City's financial affairs stand, and the changes from day to day are reflected faithfully.

If I order some printed blanks for my department today the cost is charged against my appropriation today, although the blanks may not be delivered for a week, and the bill may not be paid for another ten days. So it is with all other purchases, which means that the amount shown as expenditures also includes unpaid bills. This is made possible by the proper organization of the office of the City Purchasing Agent.

I am glad that Knoxville now has so good a bookkeeping system. It will save us taxpayers many, many thousands of dollars and we can't run behind without knowing it.

A bank prints its statements so that its customers may know how it stands. I am publishing this so that the taxpayers may see just how Knoxville stands as a business organization, and to show where the Council got the information that permitted it to distribute a portion of this year's revenue surplus back among the taxpayers. I get a new statement like this every day.

John C. Borden
Director of Finance.

THIS DOUBLE-PAGE NEWSPAPER ADVERTISEMENT ACQUAINTED THE PEOPLE OF KNOXVILLE WITH THE NEW METHOD OF KEEPING THE CITY'S BOOKS

levied a tax rate of $2.44 to balance the budget.

When I assumed the duties of City Manager in the middle of December, I began immediately the installation of an improved accounting system. As the units of this system were installed, improvements in collections began to be manifest, and the assessments of new buildings and of personal property as well as of mercantile stocks began to increase. There was no general assessment of land values this year.

By the middle of June the new financial system began to produce daily reports which clearly indicated that there would be a surplus in revenues. On the 26th of July this surplus, after setting up adequate reserves for errors in assessments, slow collections and the like, amounted to more than $300,000.

Thereupon, I recommended to the Council that a ten per cent refund in taxes be ordered, which was done.

Revenues to accrue during the remaining two months of the fiscal year, and savings on account of under-expenditures in the budget, will bring the city to the end of the fiscal year with a surplus of approximately $300,000 in its current realizable revenue assets.

Last year the tax rate was $1.90, but, based on the existing assessment, the tax rate should have been $2.93 to meet the expenditures actually made, which produced a deficit in round numbers of $1,000,000. This year, the tax rate was fixed at $2.44 to balance a reduced budget (which included $160,000 to apply on interest on funding deficits from the former administration) and now we find that by reason of underestimated revenues and overestimated expenditures, we can close the year with a surplus with a tax rate of $2.20. It would have been easy, of course, to have retained all the surplus, but this probably would have encouraged extravagant expenditures, and the Council agreed with me that it was better to make the refund direct to the taxpayers.

LOUIS BROWNLOW,
City Manager.

"Pill-Box" Patrol System Recommended for Cities of 25,000 to 200,000 Population

OMAHA, NEBR.—The "pill-box" patrol system installed by the Omaha Police Department in May, 1923, has greatly increased the efficiency of the police protection of our residential districts. Unlike most cities of similar size, Omaha has but one permanent police substation. We have 38 square miles of territory within our limits, and, necessarily a large portion of the suburbs is quite a considerable distance from either the central station or the substation.

Ten pill-box patrols have been established at advantageous locations in outlying districts. Each station is manned by two officers, equipped with a motor-cycle and side-car, and, in addition to the side-arms carried by the men, is supplied with a repeating shotgun and a box of shells loaded with buckshot for use in emergencies. During the first twelve months of their operation, the total number of calls answered from the ten stations was 10,558; the number of arrests made, 3,951. Several hold-up bandits were captured by the pill-box squad before they were able to get out of the neighborhood in which the crime had been committed. Many thieves were caught while in the act of burglarizing outlying business houses, the officers having been notified by persons living in the vicinity of the buildings where the crimes were being committed..

The use of the automobile by criminals has so completely revolutionized the police system in the

MOTOR-CYCLE OFFICERS EMERGING FROM PATROL STATION

large cities, that unless we get quick action on calls and have fast-moving vehicles ready to take up the trail, it is impossible to cope with the situation. Since the establishment of the pill-box patrol system in Omaha, the average time taken to answer a hurry-call has been about four minutes. The call comes to the central station and is immediately relayed to the nearest patrol. If the call is one of more than ordinary importance, two patrols are simultaneously notified, so that four men are on the ground within a few minutes after the call has been received.

In the writer's judgment, this system should prove especially valuable in cities ranging in population from 25,000 to about 200,000. In cities attaining a larger growth, permanent substations are usually installed, but even in these cities, the pill-box patrol could no doubt be used to good advantage beyond the limits of the substations.

H. W. DUNN,
Superintendent, Department of Police, Sanitation and Public Safety.

Gift of Fifteen-Acre Tract Provides Summer and Winter Playground

CLAREMONT, N. H.—The fifteen-acre site of Claremont's popular playground, Monadnock Park, which was presented to the city by George A. Tenney, Treasurer of the Monadnock Mills, was originally a swampy tract of land entirely unfit for recreation purposes. When work on the playground was started in 1917, it was the thought of the local committee that the ground could be drained by means of ditches and land tile. Before any steps were taken in this direction, however, the city secured the opinion of the late Charles E. Putnam, at that time Chief Engineer of the Park and Recreation Department of Boston, who made it clear that the problem was one of raising the level of the ground rather than one of drainage, since the flooded condition was due to the fact that the land level was too close to the normal level of the adjacent river.

It so happened that at that time one of the large manufacturers here had under way construction work requiring the removal of several thousand loads of dirt. As their contribution to the playground project, they agreed to unload the dirt onto the playground, at their own expense, instead of disposing of it at a near-by dump at about one-third the cost. In the middle of April, when the dumping was commenced, parts of the ground were so completely under water that a load of dirt would entirely disappear when dumped, but by July an area of about four acres had been raised and graded. This was promptly put to use as a baseball field.

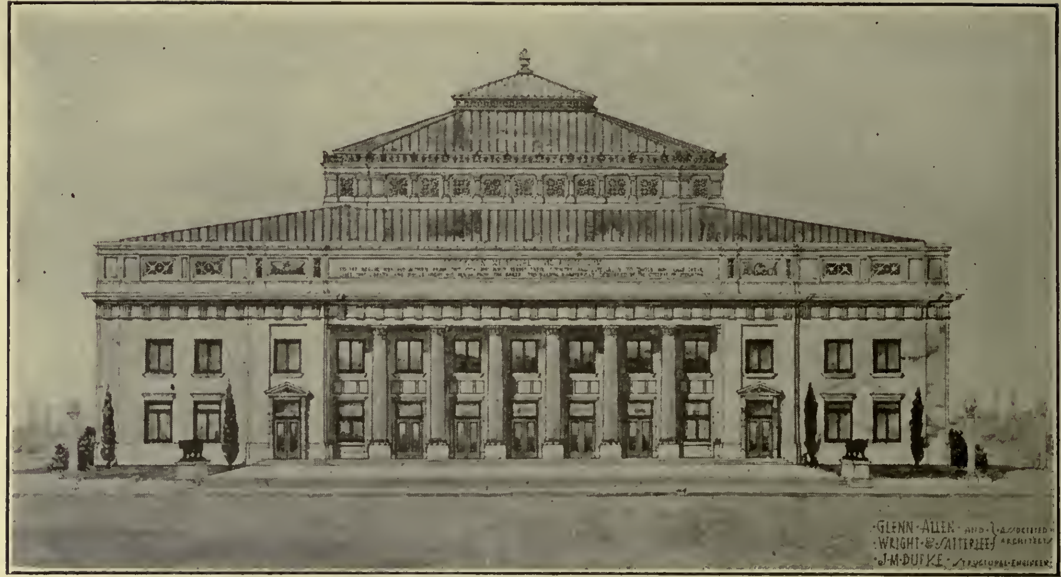
That same year a children's corner was installed and this has since been added to as necessity required. Two years later a grand stand was built, with an indoor rifle-range and shower-baths beneath it. Five tennis courts have been laid out and these are in almost constant use throughout the season. The field is also used for football and hockey. During the winter months part of the ground is flooded and a skating rink operated under supervision, the water for this being supplied by a brook whose natural course lies across the park but which during the summer is diverted to a more distant point and carried to the river.

The attendances at special activities on the playground last year included: football, 10,350; shower-baths, 1,368; hockey- and skating-rinks, 8,400; tennis, 3,500; Stevens and Sunset League baseball games, 7,000; indoor rifle-range, 1,600.

The average daily attendance on the playground throughout the year is close to 500, and in the summer season about 150 children use their corner each day.

R. G. BLANC,
Chairman, Monadnock Park Commission.

RECREATION GROUND, CLAREMONT, N. H., IN SUMMER AND WINTER



MEMORIAL CIVIC AUDITORIUM FOR WHICH CONTRACT HAS BEEN LET BY STOCKTON, CALIF.

Memorial Civic Auditorium

STOCKTON, CALIF.—On July 23 a contract was let by the city of Stockton for the erection of a Memorial Civic Auditorium, dedicated "to the heroic men and women from this city who nobly served this country and especially to those who gave their lives that liberty and justice might not perish from the earth." The cost of the structure, exclusive of the land on which it stands, will be $482,338.

The arena will be circular in shape, with a stage adequate for the largest grand operas or spectacular plays. A total seating capacity of 5,000 can be secured by throwing the small lecture hall and the banquet room into the main auditorium when the full capacity of the building is required. These smaller rooms are closed by rolling partitions when desired for separate use.

The main front of the building is to the east, but all four sides are treated as fronts, so that the building will have a pleasing appearance when viewed from any direction. The architecture is in the Roman Doric style, with massive columns and pilasters on all fronts. In the commodious lobby at the main entrance there will be four large bronze memorial tablets, two at each end. These are to bear the roll of honor of the different patriotic societies. The main lobby opens directly upon the foyer at the rear of the main auditorium, which extends entirely across the building with exits at the north and south sides. From the main lobby two inclines lead to the balcony and mezzanine floor. The foyer opens directly to the arena of the main auditorium. The arena has a level floor of hard maple, 120 feet in diameter. At the right of the arena is the lecture room, 32 x 65 feet in size, with a separate outside entrance, ticket offices and motion picture projection room; also a stage with equipment for small theatricals, lectures, motion picture exhibits, etc. At the left of the main auditorium is the banquet room, 32 x 86 feet in size, provided with kitchens, service rooms, etc.

From the arena two inclines lead to the west side of the building, so that parades may enter from the street, drive around the arena and leave at the opposite side, and the balcony of the auditorium may be used as a reviewing stand for parades, pageants, etc.

On the south of the main lobby provision is made for the club and lodge rooms of The American Legion, and on the north side for other patriotic societies. On the east side of the building is provided a beautifully finished memorial hall and museums, 25 x 65 feet in size, for war relics.

The entire building is to be heated and ventilated by a low-pressure mechanical system of steam heat, fresh air being brought in through supply fans and taken out by exhaust fans so as to change the air in the auditorium every fifteen minutes.

The building will have exterior walls of brick with an interior steel frame for all floors and roof. Partitions will be of steel studding and metal lath. The floors will be of concrete, finished with linoleum or tile, and with a maple floor for the main arena, banquet room and lecture hall.

The seating capacity of the Stockton auditorium compares with those of other cities as follows:

Auditorium	Capacity	Population (1920)
Atlanta, Ga.	5,000	200,616
Buffalo, N. Y.	7,000	506,775
Cleveland, Ohio	12,000	796,841
Forth Worth, Tex.	1,800	106,482
Houston, Tex.	5,000	138,276
Lowell, Mass.	4,500	112,759
Oakland, Calif.	10,000	216,261
Savannah, Ga.	2,000	83,252
Springfield, Mass.	4,000	129,614
Stockton, Calif.	5,000	40,296

According to present prospects the work should be far enough advanced so that the cornerstone can be laid with appropriate ceremonies on Admission Day, November 11. It is hoped to complete the structure by August, 1925.

CHARLES E. ASHBURNER,
City Manager.

The Relation of the Condition of a Pavement to the Methods of Cleaning

Abstract of Proceedings of Fourth Annual Conference of the International Association of Street Sanitation Officials

THE cleaning of a smooth, uniform pavement is not difficult, for all of the mechanical means of street cleaning may be used effectively and hand-cleaning, although expensive, is not difficult. In the case of rough pavements or those having street-railway tracks, the difficulties multiply rapidly. They have been discussed in an interesting manner by representatives of various cities attending the Fourth Annual Conference of the International Association of Street Sanitation Officials.

St. Louis, Mo.

Clinton H. Fisk, Director of Streets and Sewers, St. Louis, Mo., brought out the fact that St. Louis has practically every kind of street-cleaning equipment and method. The asphalt pavements are cleaned with a vacuum cleaner. The brick, granite block and other pavements are cleaned by flushing and by broom methods. A street that is rough cannot be cleaned satisfactorily with the vacuum cleaner or by flushing. In St. Louis, they do not try to clean streets with irregular surfaces or depressions by vacuum or by flushing, but go over them with the machine sweepers and then clean out the low or irregular spots with white wing laborers. It costs two or three times as much to clean an irregular street or a street in bad condition as to clean a street with a good surface. Believing that it is cheaper to renew the pavement, this is usually resorted to as quickly as possible.

The cleaning of irregular block streets by the brooming method has been found most successful. The vacuum cleaner tended to suck out everything that was between the blocks, and flushing drives the filler from between them. They are taking up the old blocks from the granite block streets and repaving with re-cut granite blocks, which with a grout filler gives a smooth granite surface. These streets can be cleaned readily with a flusher. The city has no trouble with the granite blocks.

Racine, Wis.

George A. Gregory, Street Commissioner, Racine, Wis., reported that they have granite block, asphalt, brick, reinforced concrete and asphaltic concrete, as well as water-bound macadam streets. Some of the streets which are very irregular require two trips with an Elgin sweeper to make a good job. In the down-town district, six white wings are employed. Heretofore they have always had about twenty-four white wings on asphalt streets. Last year these were displaced with the sweeper. In all, there are 51 miles of pavement in Racine. After heavy rains the men and teams are sent around to the catch-basins to clean up, thus doing away with the sweeper for one or two days.

Chicago, Ill.

W. J. Galligan, Bureau of Streets, Chicago, Ill., reported that the methods of street cleaning in Chicago have not undergone any radical changes in the last ten or twelve years, as they use mechanical apparatus where possible. A few years ago, the street cleaning was done entirely by hand, but certain changes, such as the restriction of immigration, have made it necessary to look to mechanical apparatus to do practically all of the work of hand sweepers. Chicago, like other large cities, employs hand brooms, machine brooms and flushers. Street cleaning is generally a question of standards of cleanliness set by the people themselves. A city is as clean as its inhabitants. If they want a clean city, they will demand it and furnish the necessary funds to secure it.

There is a provision in the Surface Lines' charter in Chicago which provides that the street-railways shall pay to the city of Chicago $60 per month per mile of double track cleaned. This amounts to about $280,000 per year in Chicago, which is considerable income for the Street Cleaning Department.

Boston, Mass.

Edward F. Murphy, Sanitary Division Engineer, Boston, Mass., reported that Boston takes charge of and cleans all the street-car lines from one end of the city to the other, except in the snow season, when it is the duty of the railway company to do its own cleaning. Any snow removed from the tracks is removed by the street-car lines. But the street cleaning, other than snow removal, is done by the city.

Minneapolis, Minn.

F. D. Furlong, Street Commissioner, Minneapolis, Minn., reported that there are 13 miles of double-track street-railways in his ward, and the street-railway company pays into the street fund for the cleaning of this track $2,600 every year. They pay $1,600 into the sprinkling fund for the extra sprinkling, and for the removal of snow they pay for 19 feet of the street. In other words, if the street was 38 feet wide, they would pay half of the expense of removing the snow on that street. The street cleaning on the car lines, the sprinkling, and the removal of snow are handled in this way in every ward in Minneapolis. The Minneapolis form of municipal government is slightly different from that of other cities, as each ward is a unit in itself. The aldermen and street commissioner in each ward are charged with the responsibility as to the methods and equipment used in street cleaning.

Evanston, Ill.

Hal W. Smith, Commissioner of Streets, Evanston, Ill., reported that they have practically every class of pavement common to other cities, totaling about 115 miles of paved streets, of which 80 miles are Tarvia surface water-bound macadam, 30 are brick, and the remainder asphalt and concrete. They do not do any flushing, but perform most of their work with a motor pick-up sweeper. The residence streets are cleaned only seven times during the summer. Considerable time was lost last season by reason of rains. There is a high percentage of dirt, running a trifle over 6 cubic yards per mile of street cleaned. The motor pick-up sweeper works as well on the macadam streets as on the other type of pavement, and leaves them in good condition. The business section of the city is swept three times a week.

Newark, N. J.

Goline Doremus, Engineer of Street Cleaning, Newark, N. J., reported that Newark has a considerable mileage of tracks, but has never asked the surface lines to pay for anything, so far as the cleaning is concerned, except in the matter of snow removal, for which the street-car lines are expected to pay the cost of cleaning between the tracks and about one foot outside. It has been so difficult to get them to pay their proportionate share that certain streets have been set aside which must be cleaned by the street-car lines, while the city cares for the entire business district where there are other tracks.

Newark cleans its streets mechanically, chiefly by flushing. They have one mechanical sweeper and use block men and gangs for pavements. There are about 287 miles of pavement in Newark, most of the pavement being smooth asphalt, brick, or improved granite block pavement with an asphalt or a gravel filler.

Relief of Street-Railway Companies from Paving Charges

Forty-six cases in which street-railway companies have been either wholly or partly relieved of the expense of maintaining pavement are cited in the August, 1924, issue of *Aera,* by J. F. Bickmore, of the Statistical Department of the American Electric Railway Association. In addition, the article reports that two states have enacted state-wide relief. To quote in part:

"In the large majority of cases the relief has been of a permanent character, having been obtained by new franchises and by ordinance amendments. Two important decisions granting relief to street-railways have been decided recently by Public Utility Commissions. The beneficiaries in these two cases were the Virginia Railway & Power Co. and the New York & Queens County Railway. In each of these two cases the financial condition of the railway was critical and the imposition of heavy paving taxes made the situation unbearable. The decision in each case prevented suspension of service and its consequent injurious results. In many cases it has not been necessary to appeal to the courts or Commissions for relief, since either the voters were made to see the situation in its true aspect with a consequent ordinance amendment providing relief, or an amicable settlement was contrived with city officials to the mutual advantage of both the city and the railway.

"The relief provided has ranged between complete exemption from the franchise requirement calling for original paving, repaving and maintenance of pavement by the company, and the relinquishment in part only of the cost of original paving. Novel aid was given the Youngstown Municipal Railway by the city of Youngstown in 1921. The railway was required to pave approximately six miles of its single-track right of way, and at that time was without sufficient funds to do so. The city loaned the company the necessary money which it raised by the sale of its general bonds. The company in turn gave the city its note amortizing the debt over a period of nineteen years. The company was thus assisted by the city's credit in raising money which it could not have otherwise obtained and was furthermore enabled to obtain it at advantageous rates."

A Unique Method of Cleaning Filter Sand

By C. H. Capen

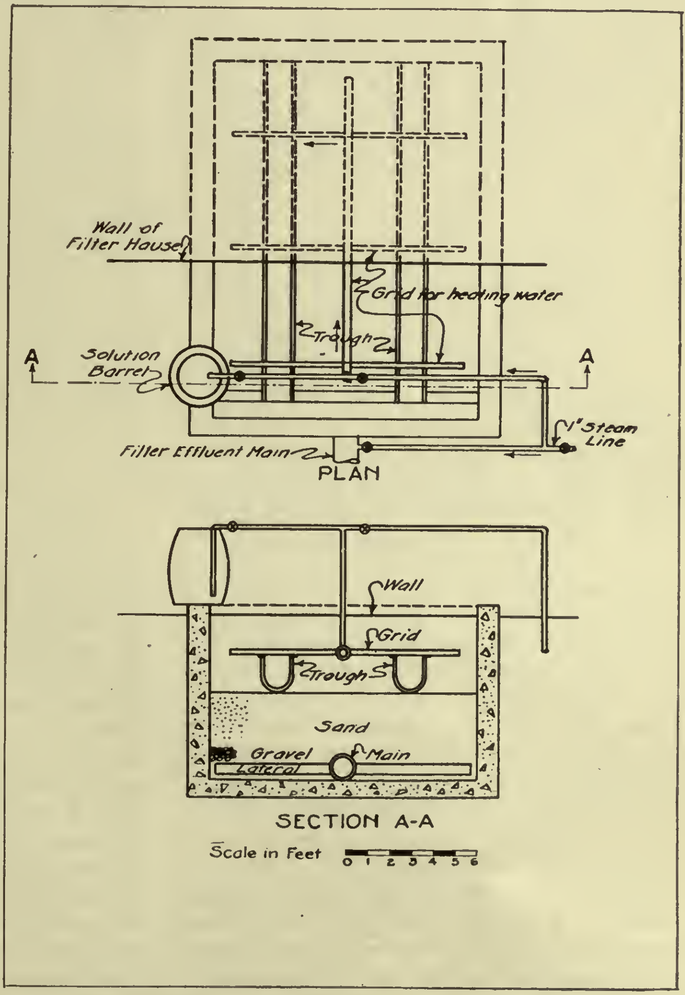
Assistant Sanitary Engineer, Bureau of Engineering, State Department of Health, New Jersey

THE city of Salem, N. J., secures some of its water from Quinton Pond, and the remainder is obtained from deep wells. The surface supply is treated by aeration, coagulation, rapid sand filtration, and chlorination. The raw water has a normal alkalinity of 1 to 21 parts per million, color from 35 to 120, and a turbidity ranging from 15 to 170. The use of soda ash is necessary at practically all times, but, even with careful adjustment of this and the alum, the very finely divided suspended solids of a colloidal nature cannot be settled out. The turbidity increases after a heavy rain-storm, and the result is that large quantities of the suspended solids are carried over to the filters. The filtered effluent is satisfactory from a bacteriological and chemical standpoint, but because of the accumulation of mud the filters were not able to maintain their rated capacity for as long a period as when they were clean, even though they were washed more frequently than was necessary when they were first installed.

The filters, three in number, are rectangular, with perforated laterals of the Harrisburg type. They have been in operation since January, 1920. Serious clogging, which doubled the amount of wash water used, led to the suggestion by the State Department of Health that the filter sand be thoroughly cleaned.

Experience at Little Falls

In the autumn of 1922, the rapid sand filters of the Passaic Consolidated Water Company's plant at Little Falls, N. J., had become clogged with oil which it is believed had been applied to the surface of the water up-stream by the various county mosquito extermination commissions. Immediate washing of the filter sand was necessary and, as a result, Frank Green, the superintendent of filtration at the Little Falls plant, developed the use of a combination of caustic soda and soda ash to wash the sand without removal. The results were very gratifying and his description of the process led the Department to believe that the same general method could be applied at Salem to restore the mechanical filters to normal efficiency.



PLAN AND SECTION OF FILTER SAND CLEANING EQUIPMENT

Difficulties Encountered at Salem

The operators at the Salem plant did not exercise sufficient care in washing the filters, and the very fine mud accumulated in the beds to such an extent that it could not be removed by the usual methods of filter washing. The wash water has an available pressure up to 15 pounds per square inch, which is more than is usually required. The overflow edges of the wash-water troughs are about 18 inches above the sand, which is consistent with present standards of design. The finely divided solid materials could not be raised or moved up into these troughs, even when so great a wash-water pressure was applied that the sand was raised beyond a safe amount.

The accumulation of this finely divided mud formed a definitely clogged film of sand and mud about ½ to ¾ inches deep on all the filters. Below this the presence of mud tapered off, but numerous mud balls were found at depths of a foot or more below the surface. Before treatment by the chemicals, the filters, even after a wash, were so clogged with mud that when the filter water was allowed to drain down below the surface of the sand, small pools of water remained on the surface on account of its inability to penetrate the mud layer.

When the filters were first installed, a sample of filter sand was submitted to and approved by the State Health Department. This sand was used to fill filters No. 1 and 3 and part of No. 2. The remainder of the sand supplied for filter No. 2 was not submitted and was much finer than the first lot. This filter, therefore, clogged more rapidly than the others. It was selected as the one on which the washing experiment should first be tried. The area of each filter is 190 square feet. For this amount, Mr. Green at Little Falls had found that about 175 pounds of caustic soda and about four times that amount of soda ash were required at his plant. In the work at Salem, about 175 pounds of caustic soda and from 250 to 300 pounds of soda ash were used. Laboratory tests might have shown that a greater ratio would have been desirable, but facilities for making the necessary tests were not available.

Procedure

Prior to the time of starting the washing process, a grid of ¾-inch pipes with small perforations at 6-inch intervals was placed over the surface of the sand, resting on the wash-water troughs. A barrel with the bung removed was placed on the concrete sidewall of the filter for use in dissolving the caustic soda and soda ash. A 1-inch steam line was connected to the filter effluent manifold, the grid above the filter and the barrel. The connections are shown in the accompanying diagram. The filter had been thoroughly washed with water, and then water was allowed to flow over it to a depth of about 4 inches above the grid. The steam was then turned on. The entire amount of commercial, fused caustic soda was placed in the barrel, and water was added until the level of the bung-hole was reached. Then the water was cut down so that just a trickle was coming out steadily, and the steam was turned on. As the caustic was taken into solution, it was carried down into the water on top of the filter; about one hour was required to complete the process. Soda ash was added in the same way, except that it was necessary to keep stirring it. The dissolving and addition of soda ash required about two hours.

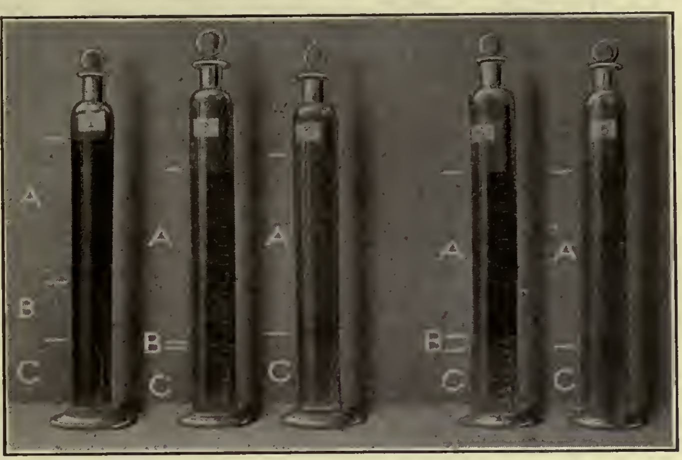
When the addition of the solutions had been completed, the water on top of the filter was thoroughly stirred with paddles. After this, the filter-to-waste valve was opened and the water was drawn down about a foot so as to obtain contact of the chemicals with the sand in the filter. Later in the process, it was drawn down about a foot more. After each period of withdrawal, water was admitted to the surface of the filter to cover the grid to a depth of 4 inches. After 12 hours of heating, the water in the filter had reached a temperature of about 175 degrees F.

Air Agitation Is Tried

During the washing process, it was suggested that an agitation of the entire sand and water mass, such as obtained by an air wash, would be beneficial. The Superintendent mentioned that an air-compressor owned by the municipality could be set up at the plant, and he was asked to install it. The air-compressor was of the gasoline motor-driven type used by contractors for work requiring a semi-portable machine. Its 1½-inch discharge was connected to the filter effluent manifold and it was operated at a pressure of from 5 to 10 pounds for a period of about 15 minutes. It was noted that the agitation was very complete near the outlet end of the manifold but was practically negligible at the far end of the filter. This was probably due to the fact that the holes in the manifold were too large for the air pressure and permitted escape over too small an area. This air agitation was given about 20 hours after the start of the treatment and again just before the end of the process.

Results

After the solution had been kept in the filter at a temperature of 175 degrees F. for about 40 hours, the filter was thoroughly washed several times, over 50,000 gallons of filtered water being used. Careful observation showed a considerable improvement in the appearance of the sand, and the operators have since stated that the filter could be run longer after this treatment than at any other time since it was first placed in operation. The results were encouraging, and it was decided to wash another filter by the same method.



SAMPLES SHOWING SAND BEFORE AND AFTER CLEANING

Accurate Observations on Second Trial

Filter No. 3 was next selected and preparations for the wash were made in a manner similar to that used for No. 2. In collecting samples of the sand, a very prominent line of demarcation of the mud layer on top was noticed, and it was suggested that this be removed by hand before starting the washing process. Accordingly, about ½- to ¾-inch of the top layers, including both mud and sand, was removed with a shovel. The total amount of material removed weighed about 400 pounds, of which about 250 pounds was mud. The moisture content of the material was about 50 per cent.

The washing process and the amount of chemicals used were similar to those descried above, except that the air-compressor was not available. After the sand had become heated, it was allowed to remain with the chemicals on it for a period of about 80 hours, after which it was thoroughly washed several times, using over 100,000 gallons of filtered water.

Samples of sand were taken after the washing process, and found to be remarkably clean. It was noted, however, that in the sections of the filter where the least wash-water velocity existed, the mud piled up in well-defined areas to a depth of about 1 inch. An attempt was made to remove this by washing the filter with a high-velocity wash water, but this method was unsuccessful. It was, therefore, necessary to remove the mud by hand, which was relatively easy, as it existed only in sections and could be readily taken up with a shovel.

The picture accompanying this article shows the condition of the sand before and after washing. In each cylinder a sample of 100 grams of dry material was taken and made up to 250 c.c. with distilled water. The mixtures were shaken thoroughly and the difference in the mud content is shown by the lines separating the water, mud and sand.

Sample No. 1 from the top of the sand to a depth of 2½ inches taken before cleaning contained 10.4 per cent of mud, dry weight. Sample No. 2 taken from a muddy section at the top of the sand after cleaning showed 2.15 per cent mud. Sample No. 3 from a clean section at the top of the sand after cleaning showed 0.5 per cent mud. Sample No. 4 taken 4 inches below the surface before cleaning showed 3.2 per cent, and sample No. 5, similarly taken after cleaning, showed 0.65 per cent.

Conclusion

It is doubtful if better results could be obtained by removing the sand and cleaning it by the more common methods of washing. It is also probable that the chemical method is less expensive and easier, as it requires less labor and less time.

Liquid chlorine, the universal protector of municipal water-supplies, is now administered for curing colds and influenza by inhaling minute quantities under suitable control.

Safeguarding Night Traffic by Proper Street Lighting

The Community Must Hold Itself Directly Responsible for Accidents Caused by Inadequately Lighted Streets

By O. F. Haas

HAVE you ever stopped to think that the coming of night virtually places blindfolds on automobile drivers and pedestrians? Not only is it more difficult to see objects after dark, but experiments have shown that it actually requires an appreciably longer time to see under a dim light than under bright illumination. When viewed from this angle, it can readily be understood why over 17 per cent of night traffic accidents are directly attributable to lack of adequate street illumination. The following discussion takes up the various types of common accidents which may be prevented by good street lighting:

Driver runs into obstruction or break in pavement.—Street lighting, especially on the thoroughfares, should reveal all small breaks in the pavement or obstructions in the street. These requirements necessitate a fairly uniform distribution of light on the street surface, against which the obstructions and dangerous faults are seen either as shadows, or breaks in the sheen of streets with a polished surface or of pavements which are wet.

Driver strikes pedestrian stepping into street or waiting in street for street-car.—The spacing of lamps should be close enough so that there will be no dark areas between units. On wide streets satisfactory results can be obtained by locating lamps on both sides of the street.

Driver collides with another machine or street-car on entering thoroughfare from side street.—On account of the additional traffic, the lighting requirements of thoroughfares are more rigid than those of the side streets leading into the thoroughfares. The thoroughfare system should be so designed that the crossings are especially well illuminated through a judicious placement of lamps. This increased amount of illumination at once indicates to the driver that he is nearing a main artery of travel and warns him to be cautious.

Driver coming into thoroughfare from side street strikes pedestrian crossing side street.—The likelihood of this type of accident is avoided by the same treatment of the lighting system as outlined in the paragraph above. A high-powered lamp at the head of the street not only warns the driver to proceed cautiously, but furnishes a bright spot of light underneath the lamp against which a pedestrian is seen in silhouette.

Driver overruns at dead-end or turn.—A lamp of adequate power placed at the head of the dead-end street or on the outside of the turn indicates the curb and surroundings. At particularly dangerous spots where the traffic is heavy, warning beacons may be used to advantage. It seems logical that a community must hold itself directly responsible for night accidents such as the one described in the following extract from a recent newspaper.

> *Struck by Four Cars, Finally Picked Up Dead*
>
> An unidentified man between 65 and 68 was struck by the fender of an automobile as he attempted to cross .... Ave. N.E. at East 33rd Street. The driver pulled up to the curb to give aid. Before he reached the victim, three automobiles had passed over the figure lying on the pavement, apparently without seeing it.

It is not an uncommon experience, particularly on a dark, rainy night, for an automobile driver on a heavy-traffic street to discover a pedestrian within a few inches of his automobile fender; a slight change in the direction of the car would have caused an accident. All too frequently the pedestrian fails to realize the danger, because he thinks that he is as clearly visible to the driver as the approaching car is to him. Bright automobile headlights against a dark background cannot be mistaken, but such is not the case with dark clothing against an equally dark background.

Automobile accidents exceeded a toll of 16,000 lives in 1923. The effectiveness of police regulations is doubtless increasing, but these can only take conditions as they are and, by education and punishment, make the best of a bad situation. Adequate street lighting, however, strikes directly at the cause—the condition which creates the hazards of night driving. Street lighting may be likened to the widening of pavements or the construction of new thoroughfares, for it allows traffic to flow forward with speed and increased safety.

The Work of a Suburban Sanitary Commission

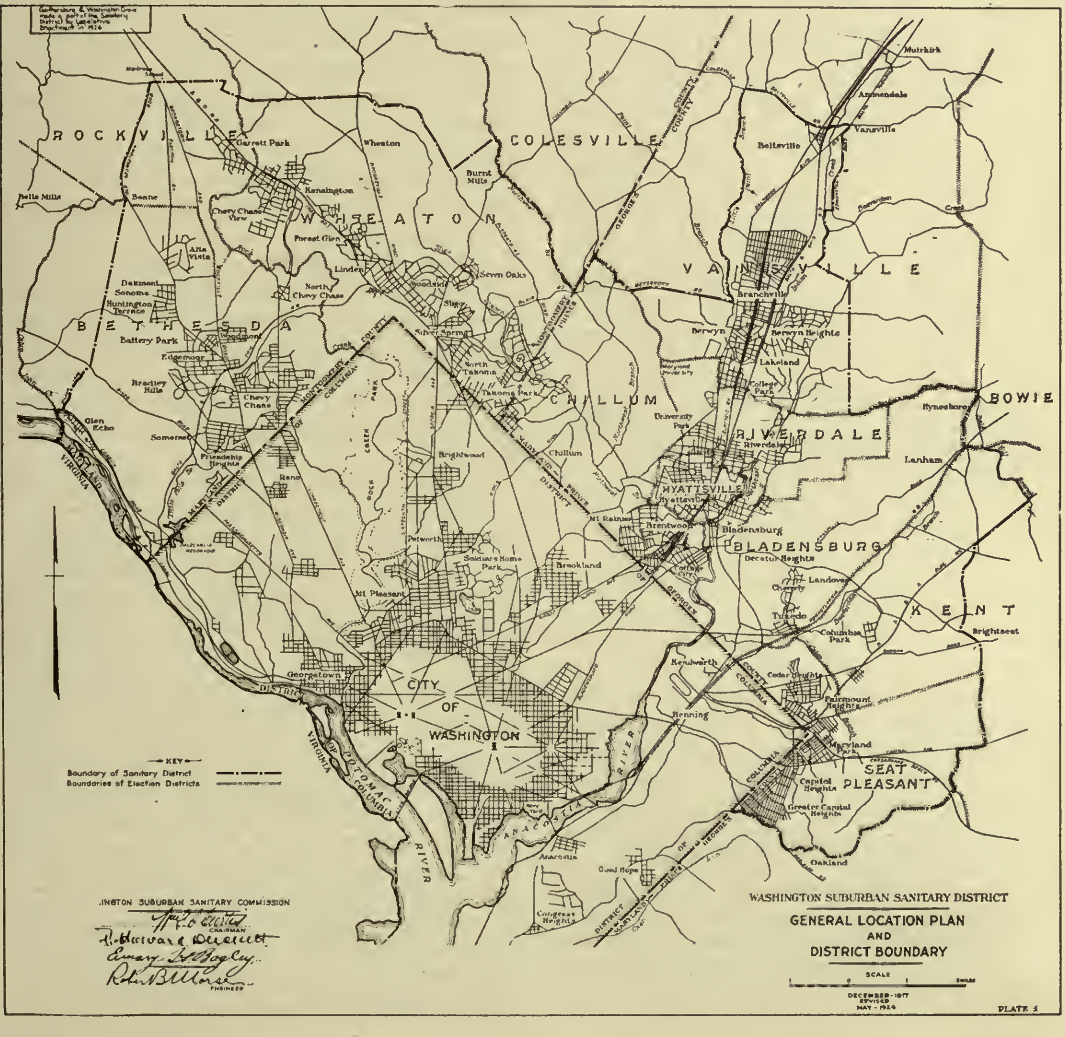
By Robert B. Morse

Chief Engineer, Washington Suburban Sanitary District, Hyattsville, Md.

MANY things may be accomplished more readily and economically by cooperation and a pooling of resources—a statement no less true when applied to the public service than to private endeavor. Especially advantageous is joint action of communities with respect to water-supply, sewage disposal, street planning and other matters that affect broad areas and whose proper solution often must depend upon natural and developmental considerations rather than political boundaries.

Near large cities, smaller communities are generally grouped. Sometimes much of a suburban area is under county government alone. This is the case in those sections of Maryland bordering on the District of Columbia. Here we find small towns, so-called taxing districts, and unincorporated villages, here huddled together, there separated by stretches of rural territory at any moment subject to real estate operations.

Only if natural conditions happen to be decidedly favorable can municipalities in such a neighborhood maintain satisfactory individual water and sewerage systems; but not even



this may be said of the unincorporated areas. Rare indeed is the county government that can or will provide these systems.

More than a dozen years ago the need for collective action near Washington was becoming manifest. Sanitation was at a low ebb. Growing towns were having difficulty in developing adequate and safe sources of water-supply; real estate operators in unincorporated areas were constructing hopelessly inferior community water and sewerage systems; streams were becoming fouled. Just one hope appeared—that of developing comprehensive projects for the whole suburban section.

No large water company was operating in the vicinity. So it became evident that the desired water-supply as well as the sewerage project could be put into effect only by a central public body. This alone appeared definite. Other questions were not so easy to answer. Should this body build and operate the supply and purification works, deliver water through its own main feeders to the various municipal systems and construct general distributing mains only in unincorporated sections? Ought it to install only the trunk sewers and treatment works, together with the minor collecting sewers in communities outside of municipal boundaries? Or might it not be simpler and more economical to take over all municipal and private water and sewerage systems, merging them into a vast, coordinate unit? How might the funds be provided for so large an undertaking? Could a plan be formulated under which, during a period of excessive costs, the great expense might be met without undue burden on this area, none too populous or wealthy, but with prospect of rapid growth? Must the founding and continuation of this necessary public work be subject to the affirmation of an electorate with, we may assume, not too broad a vision?

These, and many minor questions, were thoroughly considered by a commission of three citizens of the affected area in Montgomery and Prince George's Counties. This commission was created by an act of the Maryland Legislature of 1916 for the purpose of studying the problem. These same gentlemen, and others, appointed by a former governor, had, in 1914 and again in 1916, submitted bills to the Legislatures of those years comprehending the establishment of an organized sanitary district. Apparently, the plan was ahead of the times. In 1918, however, the bill prepared by the Commission of 1916 was enacted into law, and the Washington Suburban Sanitary District became an established fact.

Powers and Duties of the Commission

The Sanitary District, lying partly in Montgomery and partly in Prince George's County, Maryland, has an area of 95 square miles and a present population of more than 40,000. The taxable basis is approximately $45,000,000. The population has doubled since 1910 and the taxable basis since 1918.

The administrative body consists of a commission of three members, one appointed by the County Commissioners of each county, upon recommendation of the State Board of Health, and one by the Governor of the state. The term of office is four years. The Commission is a body corporate, for the purpose of establishing and operating water and sewerage systems throughout the Sanitary District. It has power of condemnation. It issues its own bonds, prescribes the amount of annual tax to be collected by the two boards of county commissioners, and levies and collects its own front-foot assessments, said tax and assessment covering fixed charges on the bonds. It fixes and collects service rates to meet maintenance and operating costs.

The Commission also is required to issue permits for and to inspect all plumbing. So great has been the demand for extension of the water and sewerage service that inside plumbing has thus far escaped attention. Plumbing regulations are, however, about to be issued and organized inspection undertaken.

Collection and disposal of garbage and refuse, wherever warranted, constitute another of the Commission's duties. The date of beginning, however, is left to the discretion of the Commission, and inauguration of the service has been deferred until a more opportune time.

A short period of operation disclosed the fact that it would be impossible to design and construct thoroughly satisfactory and economical water and sewerage systems without supervision over street alignment and grades. Some of the municipalities had exercised control of an indifferent sort over their streets, but practically everywhere a developer could do as he pleased. There had resulted the utmost confusion in street development. A section having great possibilities was being spoiled through lack of coordinated planning. No thought was given to a major street system, parks or parkways. It was a question only of—How many lots of a certain size can I get out of my property? There was no fitting of streets to topography, little or no variation of street widths, no attention to what one's neighbor might need in the way of outlets, slight thought of economy in the matter of

A P. & H. TRENCHING MACHINE WORKING IN HYATTSVILLE, MD.

drainage or grading—just a dismal monotony of dead-end, broken-back streets, many with such gradients that only a goat could climb them with ease, and all 30, 40, sometimes 50, but rarely 60 feet wide, depending upon the whim of the developer.

Out of it all, though opposed most sharply, there originated, in 1922, a system of street control. So it happens that the Commission now has to perform the additional work attendant upon mapping out a street system, approving all subdivision plants before being recorded, and establishing street grades outside the boundaries of municipalities.

Financing the Project

Except for the fundamental questions decided so as to result in the prosecution of the work unhampered by any form of referendum, and in a single ownership of all water and sewer lines throughout the District, the most important matter before those drafting the original legislation was the evolution of a feasible and equitable plan under which the project might be financed without public burden.

If any such plan could be devised, manifestly it would have to be based upon the principle of allocating, as nearly as practicable, the expense to the public and to each individual in proportion to the benefit received. It is hardly feasible, nor is it necessary, to classify benefits with scientific precision. The most technically accurate scheme would require tempering to satisfy local conditions and prejudices. We can hope only for a plan of meeting costs which recognizes the general principles involved.

Broadly speaking, three grades of economic benefit are derived from the construction and operation of either a water or a sewer system. The man who owns property in a community or district in which there is a system gains some advantage even though his land is not so located that it can be served at once. Property along a water-main or sewer is benefited much more, whether improved or unimproved. The greatest advantage, naturally, falls to the person who actually uses the service. The owner of the first-mentioned property, therefore, should pay least, and the user of the service most. The problem is resolved into one of accomplishing this end in a logical manner.

Funds are obtainable from three sources—taxes, special assessment, and service rates. Unless a system of zone taxation is employed, the tax rate should bear only that part of the expenditure which represents benefit independent of location. Special assessments must cover the cost of providing those elements of the system giving locational benefit. We shall not stray far from scientific accuracy if the amounts collected from taxes and special assessments are made sufficient to meet most of the construction costs, that is, the fixed charges on the bonds. Rates for service, then, need not much more than pay the expense of maintenance and operation.

It would be theoretically correct to charge the tax rate with at least that proportion of the cost of reservoirs, pumping-plants, purification and treatment works, and main feeders and collectors, which is made necessary through provision for future growth of the territory. This sum is spent for the benefit of all property. The remainder of the capital expenditure for the main elements of water and sewerage systems may be met, perhaps with almost equal justice, by special assessments on the property abutting water or sewer lines, or by service rates. The tax levy should include, also, much of the cost of general studies and surveys which form a basis for future operations.

The property adjacent to water-mains and sewers ought to bear the expense of the distributing system and the lateral sewers. There appears to be no more equitable way of doing this than by front-foot assessment. This benefit charge should fall equally on improved and unimproved lots, for it costs as much per foot to lay a pipe in front of one as the other. The rate should be uniform for a particular class of property, regardless of variable costs of work in different neighborhoods.

House connections are equitably chargeable to the property served. Payments should be equalized for connections of a given size, because the owner has no voice concerning the location of the main pipe. He ought not to be penalized if his service is longer than the average, nor yet receive the benefit if it is shorter.

The plan of financing the operations of the Washington Suburban Sanitary District was worked out along these lines. With a few additions and modifications found advantageous by experience, it has proved a practical scheme for executing the work and has not been burdensome, in spite of the era of high costs.

In a project of this kind, ever growing and spreading, any endeavor to determine ahead the cost of those parts of the projected systems properly chargeable to the tax rate would have been as futile as it was unnecessary. The amounts required to pay interest and sinking fund charges on the bonds issued from time to time were met by the easier method of fixing the front-foot assessments first and then obtaining the balance through general taxes. The fundamental philosophy, nevertheless, was ever in mind. So much of the District's area is still in a rural state, and will be so far removed from early extensions of the systems, that it has seemed advisable and just to keep the tax down to a low figure. However, the supply mains and trunk sewers must be so long, to serve the many scattered communities, and all main elements of the systems require such an excess of capacity, in order to be adequate for a large increase in population, that rates for service soon must bear that part of the capital cost of the above which is not allocated to the tax rate. Front-foot assessments will be sufficiently large if they cover the expenditure for minor piping.

It is the practice in most places to make front-foot assessments for an improvement payable in one sum, or in several annual installments, the number generally not exceeding ten. If bonds are issued to cover the cost of the work, this course imposes an unnecessary burden. Why not levy small assessments during the whole life of the bonds? The front-foot assessment thus becomes in fact a small additional tax, but one which is a fair measure of the benefit received. This plan is followed in the Washington Suburban Sanitary District. As its bonds are issued for a term of 50 years, the annual payments are very small. This is the principal reason for the financial practicability of such a large project in an area of comparatively limited wealth. The assessment may be met in one sum when the pipe line is installed, or it may be extinguished on the present worth basis at any later date. The number so paid up, however, is so small as to be negligible.

Under the Commission's financial plan it is merely necessary at any time to know the taxable basis of the District, the number of assessable front feet, and the fixed charges for the ensuing year on all outstanding bonds. The assessments and tax then may be proportioned as desired.

The schedule of charges at present is as follows:

Tax 5 cents per $100
Front-foot assessment, annually, water 10 cents, sewer 12 cents
Water connection to property line, ¾-inch, $30
Sewer connection to property line, $30
Service charge, ⅝-inch meter, $4 per year
Water consumption, first 25.000 gallons semi-annually, 15 cents per 1,000 gallons

For the purpose of assessment, property is classified into business, subdivision, small acreage and agricultural. The figures mentioned above are the basic ones for all except the business classification, which is assessed at a higher rate. Small acreage and agricultural property are subject to certain modifying rules. On long frontages (in excess of 150 feet for subdivision property) the unit price is radically decreased. Corner lots in subdivisions are assessed only on the front. The depth of a lot has no influence on the assessment.

The charges for water and sewer connections may be paid in one sum, or in four annual installments, the deferred payments bearing interest at 6 per cent. Water connections larger than ¾-inch in diameter are furnished at increased cost.

All water connections are metered. The service charge covers interest and depreciation on the meter and those elements of maintenance and operation that are independent of the amount of water furnished, that is, unregistered water, reading and billing. The service charge for meters larger than ⅝-inch is graded according to the size of meter.

Water consumption charges include the cost of maintenance and operation of the sewerage system as well as all of the expense of maintaining and operating the water system except that part appearing in the service charge. This is equitable and convenient. The charge is graded down to 8 cents per 1,000 gallons for large quantities of water.

Consider, now, the annual expense of the following representative cases:

1. Property assessed at $5,000, and not on a water or sewer line
2. Unimproved lot, with 50-foot frontage,

assessed at $500, and on a street having a water pipe and a sewer

3. Residence on a 50-foot lot, assessed at $5,000, connected to water and sewer lines, and using 50,000 gallons of water annually

The first property would pay $2.50 each year, the second $11.25, and the third $25. The last owner would expend, also, a total of $60 for connections.

Even if the third property had a frontage of 100 feet, in which case the charge would be $36, the owner would pay for complete water and sewerage service, including fire protection, hardly more than for either gas or electricity, and perhaps not as much.

It is obvious that the Commission's plan grades payments in accordance with benefit received, and that it is not burdensome to the ordinary holding.

Difficulties Encountered

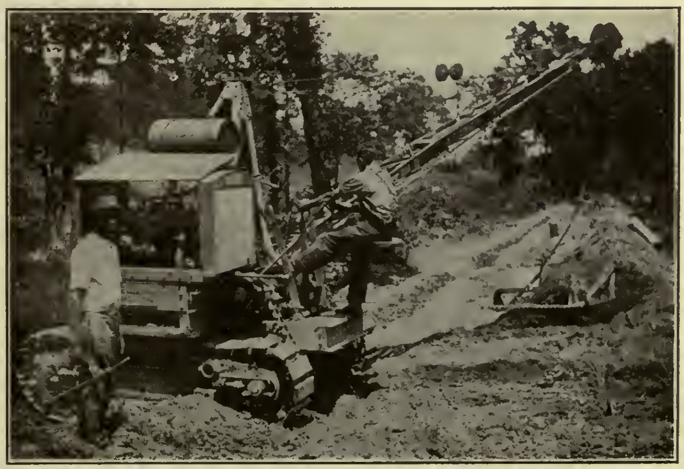
Established municipal governments are often beset with difficulties when installing water and sewerage systems. Consider, then, a brand-new scheme of organization, an untried financial plan, an area, more than a third larger than the District of Columbia, lying in two counties and comprising numerous small municipalities and a large amount of unincorporated territory. Is there any wonder that the Commission has had other than constructional troubles in getting the project firmly established? It was a "foreign" organization, so to speak. It was "more powerful than the king," quoting a campaign speech. To incorporate all existing systems into one covering the whole area required broad powers, but comparison would show that they are no more sumptuary than those possessed by most municipal governments.

As the plan of operation has become better understood and the stimulation afforded to development becomes evident, opposition has diminished. Protests about street conditions and taste of water are still with us, but it augurs well that they are no more frequent than those concerning the delay in extending service to one's property.

In addition to external difficulties produced by the novelty of the project, the Commission has been compelled to overcome many other obstacles not generally encountered by a single municipality of equal population. These relate not so much to conditions surrounding construction as to procedure in a somewhat unusual situation. Administration offices in Washington and engineering offices in the Sanitary District, a distance of twenty miles or more apart, and lack of belt line transportation and circumferential highways, do not facilitate the work of the Commission nor its engineering staff.

An important problem has been that of providing here and there an immediately necessary element or link that would later expand into a coordinated system adequate for a population much greater than that of to-day. No considerable mistake must be made. The part now built must perform its function in the future. A pipe may be supplemented by a larger one following a different route along a highway not yet opened, a piece of machinery may be moved to another and permanent location, a dam may be raised, but elimination must be minimized. Naturally, however, many of the inadequate municipal water-supplies, pumping-stations, sewage treatment works, small mains and improperly constructed sewers have been abandoned, and more of them will be. Also, a few small temporary water pipes have been purposely laid in streets that eventually must be the routes of main arteries.

Perhaps the greatest problem of all has been the difficulty of meeting the insistent demand for extension of service. The attempt to do so, and the necessity of keeping down capital expenditure, have delayed construction of the permanent water-supply and purification works and also the trunk sewers. Temporary plants, progresssively installed, are now supplying the rapidly increasing water consumption.



AN AUSTIN BACK-FILLER AT WORK AT HYATTSVILLE, MD.

Work Completed and Projected

Bonds issued or assumed by the Commission now amount to about $3,200,000. At the end of 1923, the Commission owned approximately 225 miles of water-mains and sewers. Almost exactly half of this mileage was built in the last four years. Lines purchased or otherwise acquired comprise the remainder.

Temporary water filtration plants and pumping-stations have been erected at Hyattsville and Burnt Mills, with daily capacities of 1,000,000 and 2,500,000 gallons, respectively. The small works formerly owned by the town of Takoma Park have been increased in capacity from 300,000 to more than 1,000,000 gallons per 24 hours. The supply systems at Takoma Park and Hyattsville will have soon served their purpose, except for reserve, and the Burnt Mills plant will have its place taken, within a few years, by permanent purification and pumping works of much larger size.

An impounding reservoir, with a capacity of more than two billion gallons, and located on Northwest Branch, will form the permanent source of supply for the District, or a part of it. This stream has a drainage area of about 27 square miles at the site of the proposed dam. Whenever necessary, it will be economically feasible to store the water of the Patuxent River, a much larger stream, and convey it to the Northwest Branch reservoir, a distance of five or six miles. Or, if the District expands to the northeast, as seems probable, the Patuxent River water may be filtered near Laurel and enter the main distribution system at that point. Already the District has been extended to the northwest so as to include the town of Gaithersburg, seven miles or more from the original boundary. This makes probable the early use of Seneca Creek as well as Northwest Branch.

Disposition of part of the Sanitary District's sewage will be through the District of Columbia trunk lines, as soon as these have been extended to the common boundary line. Sewage originating from the easterly section of the District, however, probably will be treated near Bladensburg and discharged into the Anacostia River, although it is possible that this also may enter the District of Columbia system.

Organization of Force

Accounting, assessing, meter reading, billing, etc., are attended to by the administrative office. The engineering work is carried out by three departments—those of headquarters, construction, and maintenance and operation. From 50 to 60 men, including the chief engineer, deputy chief engineer and three department engineers, constitute the engineering personnel. The number of plant attendants, foremen, skilled and unskilled laborers, varies with the season. At present it is something over 300.

It has been found far more satisfactory, and at least as economical, to perform much of the work by day labor, particularly the installation of water-mains. The amount thus accomplished is constantly increasing. Out of about 39 miles of water mains and sewers laid in 1923, nearly 24 miles were built by the Commission's forces. All house connections, which average about 150 per month, are now installed by day labor.

Conclusion

The Commission's work seems to be of ever widening scope. The main elements of its projected systems have not been provided yet, nor even all immediate requirements satisfied. Its efforts, nevertheless, have made feasible a development of the area much more rapid than would have been possible without them.

The plan under which the Washington Suburban Sanitary District was established and is operating has served as an example for the foundation of two similar areas near Baltimore—the Anne Arundel County Sanitary District, organized in 1922, and the Baltimore County Metropolitan District, now about to start operation. Several others have been under discussion, and a number of towns in Maryland have had legislation enacted providing for water-supply and sewerage work to be done under a similar financial plan. From present indications, such districts as the one now existing near Washington will spring up in various sections of Maryland, because the type of organization is a feasible one; and the Commission's financial plan will become widely used by single municipalities in that state, because under it the expense of water and sewerage systems may be met equitably and without burden to the budget of the district or to the taxpayer.

Acknowledgment.—From a paper read before the American Chemical Society.

A POLICEWOMAN'S AMBITION

Every city is coming into line with a full quota of policewomen. That is as it should be. There is a place for them in every community, no matter how small. One of the most capable policewomen in the country recently said, "We do not wish to usurp the place of the policeman. Rather it is our aim and object to become to him what the trained nurse is to the doctor." An unselfish, manlike attitude that is commendable!

THE POLICE JOURNAL.

Welfare Week-Ends---A Device in Community Organization

By Earl Kilpatrick

Dean, Extension Division, University of Oregon

TWO "Welfare Week-End" programs, one in Oregon City in January of this year and one at Pendleton in March, are not enough from which to judge the full possibilities of the device. The cordial cooperation of eight state agencies in a joint educational effort appears to us to have been a distinct achievement. The enthusiastic repetition of that educational endeavor in a second community seems still more significant. Eagerness on the part of all these agencies to continue the cooperative experiment in still other communities next fall encourages us to believe that there is much vitality and value in the idea. The same impression comes from the citizens of Oregon City and Pendleton who attended the sessions.

The state agencies participating in this new type of community institute are the Oregon State Board of Health, the Oregon Child Welfare Commission, the State Industrial Accident Commission, the Tuberculosis Association of Oregon, the Medical School of the University of Oregon, the Industrial Welfare Commission of Oregon, the Oregon Board of Inspectors of Child Labor and the Oregon Social Hygiene Society.

A New Type of Community Institute

The "Welfare Week-End," as it is being developed in Oregon, has for its chief purpose the exposition in communities of the facilities and services available from state agencies. It is intended to be a step in the direction of intelligent and proportionate, rather than accidental and haphazard, community organization. Briefly described, it consists of a series of addresses, clinics and exhibits, running through two days, by which the state agencies for health and welfare, every one speaking for itself, build up a comprehensive picture of the whole problem of welfare in the community and indicate solutions.

At Oregon City these state agencies had the local cooperation of the city and county schools, the city and county Parent-Teacher Associations, the Woman's Club, the Chamber of Commerce, the Kiwanis Club, the County Health Association, and the newspapers. At Pendleton the cooperating local agencies included the County Public Health Association, the American Red Cross, the city and county schools, the city and county Parent-Teacher Associations, the Council of Women's Clubs, the Pendleton Commercial Association, the County Dental Association, the Ministerial Association, the County Court, the Rotary Club, the Exchange Club, the local physicians and the newspapers.

The Pendleton program opened on a Friday noon with a public luncheon arranged by a committee of the Pendleton Commercial Association. On Friday afternoon presentations were by the State Board of Health and the Social Hygiene Society. Friday evening was given over to the Industrial Welfare, Child Labor and Industrial Accident Commissions. Saturday morning was kept free for three clinics—well baby, tuberculosis and orthopedic. Saturday afternoon was assigned to the Shepard-Towner work of the State Board of Health, the hospital service for sick and crippled children of the Medical School, and the Tuberculosis Association. On Saturday evening the Child Welfare Commission explained the state's interest in delinquent and dependent children, and the director of the School of Social Work summarized the results of the sessions. Exhibits were installed in the meeting-place by all of the agencies participating.

The idea of these welfare week-ends was first proposed by Margaret D. Creech, Assistant Director of the Portland School of Social Work of the University of Oregon. The name was suggested by Dr. Philip A. Parsons, Director of the same school. Miss Creech asked that the plan be tried through the extension service of the University, and supported her request with the following argument:

> "The state of Oregon maintains many agencies for the maintenance and improvement of the health and welfare of its people. These agencies have extensive programs and employ many experts. Every community in the state has frequent need for the services of all of them, need which at pres-

ent is often imperfectly realized. Some of these agencies employ field representatives to make contacts with local communities. Frequently the nature and extent of work undertaken in a community are more directly dependent upon the activity of such field representatives than upon the initiative of citizens of the community. This makes for poorly proportioned development of health and welfare work and leads to neglect in those fields of activity which are not vigorously promoted by some one from the outside. Clearly there is need for occasional unified and comprehensive presentation of the problems of health and welfare in the light of the actual conditions of the individual community, which will assist the leaders in the community to plan the best use of state agencies in meeting local needs. Since no operative agency can well take the lead in coordinating the others, and since practically all of these agencies are already cooperating through service on the faculty of our School of Social Work, it occurs to me that the University might well arrange such programs.

"I suggest therefore that the Extension Division undertake to promote week-end programs, perhaps two days in length, in several communities, in which the representatives of the state agencies for health and welfare will be asked to participate through addresses, clinics and exhibits, with the understanding that their efforts are to be directed toward two definite ends:

"First, the best possible statement to the people of each community by the experts of each agency of the status in that community of the problems for the solution of which that agency exists, and

"Secondly, a clear statement of the facilities which that agency can make available to the people of that community for dealing with those problems."

Responding to this request, the Extension Division outlined the plan to a group of representative citizens of Oregon City, fifteen miles from Portland, and received a cordial invitation to arrange the first Welfare Week-End program in that community. The idea was then presented to the executive officers of the several state agencies. Without exception they were interested at once and expressed the wish to cooperate. The second program in Pendleton was more than 200 miles from the home offices of the agencies and, thanks to excellent local cooperation, was conducted with no more difficulty than the first one, which was only half an hour from Portland. Invitations now in hand for future programs have come from Bend, Astoria, Medford, Eugene and Marshfield.

Items of Encouragement and Guidance

In the course of the preparation and carrying out of the first two series of programs, several points became clear which serve to encourage and guide further experimentation. They may be summarized as follows:

Expense.—Such a series of programs involves practically no additional expense to state or community. The several agencies are under obligation to visit the communities, anyway, with service and promotion. It costs them no more to do so in such cooperative fashion, and the expense is met out of their regular allowances for travel. Places for meetings, clinics and exhibits are readily secured without cost.

Value to Agencies.—Such an experience of cooperation has much value for the coöperating agencies. It has been understood in the progress of this experiment that the representatives of every state agency would attend the meetings addressed by the representatives of the other agencies. There have been, as a result, many striking examples of improved understanding of the work of one agency by another, leading to immediate and specific cooperation. Luncheon meetings of agency representatives in Portland following each program showed distinct development of group morale among persons who had formerly not been accustomed to cooperate closely with one another.

Intrinsic Value of Services.—The addresses were of excellent quality and would have been worth while quite aside from the general plan. Some agencies made preliminary surveys of the counties in order to be able to speak with more authority as to local conditions. The clinics justified themselves. Many people in both towns were heard to say that the definite result of securing hospitalization of a number of crippled children for the correction of their deformities was enough to justify all the time and effort spent upon the whole affair. The exhibits would have seemed worth while, in and of themselves. It thus appears that whatever community organization values were attained may be considered additional benefits derived from a series of meetings which carried their own justification in specific service.

Attendance.—At none of the sessions was attendance so large as might conceivably have been secured by comparable publicity for a single session by one agency alone. The effort was to secure attendance throughout the sessions of leaders. This effort was measurably successful. Those who attended were quite faithful in following the meetings through from first to last and seemed to catch the central idea of the desirability of a unified, comprehensive community program. They were, to a considerable extent, members of boards of directors and persons otherwise influential in determining the policies of community agencies.

Rural Cooperation.—Through the county press and through county-wide organizations like the rural schools, the Parent-Teacher Association, the Red Cross, and the county organization of the Tuberculosis Association, news of the meeting was diffused throughout the counties and there was representative attendance, even from remote parts of the counties.

Local Auspices.—No formal local auspices were thought necessary or desirable, but all the local persons and agencies interested cooperated actively in promoting interest and attendance. An informal and temporary local committee cooperated in making arrangements for meeting-places, in securing local publicity and in arranging local participation on the program. Thus the community was left with much information but without any formal attempt at comprehensive organization for purposes of coordination. To some, this may seem unduly conservative procedure, but we felt that lack of demonstration up to the present time of the uniform utility of any set device for local community organization dictated the wisdom of leaving initiative entirely in the hands of the local community.

The University's Function.—The function of the Extension Division and of the School of Social Work was conceived to be to suggest the plan, to arrange the program, to assist with the publicity and to make occasional speeches showing transitions and relationships, but in no way to make specific suggestions to any agency as to the matter which its representatives should present. Each agency therefore stated the community need from the point of view of its own contacts and its own facilities. The result was surprisingly unified. Various representatives of participating agencies helped in the advance work for the second meeting, but all were agreed that the coordinated program could hardly have been suggested or promoted by any one of the operative agencies. We agree, but we believe that such meetings might well be arranged in this or other states by any other detached state agency of education or social service or in any community by a committee of interested citizens.

Closer Coordination.—At the beginning there was some thought of carrying a single coordinating thread, such as the discussion of a hypothetical problem family, throughout the sessions, but this was abandoned as impracticable. We are still searching for some such simple unifying idea, which will enable us to dramatize, as it were, the whole presentation. We are, however, encouraged by the extent to which the abstract idea at the basis of the plan has been apprehended, both by agencies and by citizens.

The University of Oregon and all of the agencies which are cooperating in this experiment will be much pleased to hear of similar ventures elsewhere, especially if the reports may indicate the degree of success attained in comprehensive presentation of local problems and of state facilities, and even more importantly any indication that the local communities have profited by such presentation to improve their intelligent use of such facilities.

Survey of Social and Living Conditions Essential to Wise City Planning

WHAT has a survey of social and living conditions to do with a city or regional plan? This question was answered at the recent Town Hall meeting of the Committee on Regional Plan of New York and Its Environs, by Lawson Purdy, General Director of the Charity Organization Society of New York, in a paper from which the following paragraphs are abstracted:

"City planning means the public regulation of land, public and private. For the lack of such regulation we have wasted public money on building streets and sewers before they were needed, on making many streets too wide and others too narrow, on widening streets at great expense and destroying valuable buildings in the process. After population was congested, we have spent great sums on the acquisition of land for parks and recreation grounds and schools, and have not been able to devote sufficient land to such purposes. Because of the invasion of residential areas by industry and trade, we have destroyed good dwelling houses and rendered good school buildings useless. All this waste of property, public and private, is due to failure to plan in advance and to regulate the use of land by appropriate governmental action.

"However desirable some regulation might appear, it cannot be arbitrary, but must take account of the habits and desires of the people; hence the necessity for a study of the trend of housing development in the past in order to determine a plan for the future.

"By the use of public records, checked by personal inspection, 55 sections of the city of New York have been studied to determine the trend of housing development during the last ten years. Such complete public records were not available in the region outside the city of New York, and public records have been supplemented by private records, interviews with well-informed persons, and personal inspection in the case of 242 governmental units in the region around New York.

"The records made show where dwellings are being erected, where single-family houses predominate, where two-family houses are numerous, and where multi-family houses are in demand. Certain tendencies are apparent. Apartment buildings are growing larger and apartments are growing smaller. The guest room is no more. The same tendency appears in the building of single-family dwellings in outlying boroughs and in suburban towns. Houses are smaller; the demand to-day is for houses of five, six, or seven rooms. The small house and a garage have taken the place of the large house and a maid. The advent of the car has made necessary space for a driveway, and the tendency is to use larger lots for small houses. These records will help to determine where through thoroughfares shall be and where the residential streets; where playgrounds shall be bought in advance of the need, and space for parks and public schools and all public buildings. The city planner can make provision for all the public needs of the future and they can be met at a small fraction of what they would cost when population has become dense.

"City planning can make future conditions far better than the past, so that the many millions who will live in this area in the next generation may have far better opportunity to develop all their powers of mind and soul. City planning by city planners will never accomplish this unless in the process the public generally acquires a seeing eye and a willing mind. The eye must be able to see in imagination a wholesome, useful community where each one so uses his own land as not to infringe the equal right of his neighbors to the fullest use of theirs. They must have minds willing to seek their own advantage without injury to others, to protect their neighbors' rights and so protect their own."

A Complete and Well-planned Paving Program

Abstract of Local Publicity to Acquaint Taxpayers with Plans

By C. A. Bingham
City Manager, Lima, Ohio

OF the $2,000,000 worth of street paving built by the city of Lima, Ohio, since the inception of commission-manager government in January, 1922, the Main Street improvement stands foremost as a particularly well-planned piece of work in which more attention was paid to the preliminary work than is customary in most cities. This city of 55,000 population has 3,000 feet of its main business thoroughfare so paved and so arranged as to underground and surface structures as to facilitate the work of the utilities, which paid over $400,000 to help the city in this endeavor. There has been considerable dissension in the last six years as to what material should be used in paving the streets. To instruct the citizens in the numerous details which have been worked out, the following paragraphs were prepared for local publication and are reproduced here not only to show the excellent manner in which this street work has been planned, but also to show municipal officials how one city is reaching its taxpayers with complete, truthful details of proposed construction.

"As the foundation is the most important part of any street, it is well to state first that this is to be of the best concrete and 8 inches thick. All backfilling is specially tamped around and over the structures and all trenches flooded three times at intervals of several weeks, but regardless of whether the trenches have stood one or two winter settlings or whether they were recently installed, a special concrete base will be laid, to a width of 2 feet beyond the edge of the trench, to give support on solid ground. This portion of the foundation will be 12 inches of concrete and will be reinforced and ⅝-inch steel rods placed every 6 inches apart. Additional protection will be secured by sloping this extra depth beyond the 2-foot limits in wedge shape, not only to prevent a crack at its junction with the regular foundation, but also to preclude any settlement. It is also well to mention here that in all trenches over 8 feet deep, heavy side sheathing was left in the trenches and the sides braced with 4- x 6-inch cross-pieces. To the stranger, this may seem extravagant, but it must be remembered that while the southerly end of this street has gravel and sand subsoil in which very little settlement may be expected, the remainder of the work was in a clay which has been found by experience to continue settling for an unusual time unless every precaution is taken.

"Over trenches which were back-filled immediately ahead of the pavement special reinforcement was used, as shown in the accompanying photograph, consisting of 72-pound steel rails 8 feet long, placed every 6 feet across the trench, and a mat of ⅝-inch steel rods wired together 6 inches apart in both directions placed on the base of these rails, and the entire reinforcement encased in 16 inches of concrete.

"This city, in common with many others, had never planned its sewers ahead; and as the city grew, the shallow and inadequate sewers were continually flooding homes and business properties. A comprehensive plan

KOEHRING PAVER WORKING ON MAIN ST., LIMA, OHIO of relief and intercepting sewers was made, and already about $3,000,000 has been spent in this section of Main Street, starting at the north end with an 18-inch and ending at the river with a 48-inch pipe. At first, we believed the present sewer, which covered a large portion of the street and varied from 18 to 36 inches in size, would suffice, but upon close inspection it was found that the old sewer was too shallow for deep basements, as would be required in the new type of business buildings, and furthermore it ran only half-way up the street, thus leaving the north end without any real sewer outlet, and this condition would have been made worse by the many new catch-basins installed for the new paving. This additional sewer has now been laid at a cost of about $90,000. It is from 16 to 20 feet deep and has had all existing cross-street sewers connected into it. Much of the work has been done in tunnel. The almost impossible conditions under which the work had to be done, on account of the numerous existing lines of various utilities, may be appreciated when we say that over 400 obstructions were encountered in 2,700 feet of main sewer and included everything from the old-fashioned fire cistern to ancient corduroy roads. Practicaly all buildings have been connected to the new sewer.

"Forty extra large and direct-connected catch-basins have been built and are so arranged that, regardless of extreme rainfall, no flooding will be experienced and by careful placing of the basins it will be possible to lay the pavement flush with the sidewalks running lengthways of the street. In crossing the main street itself, the usual 6-inch face of curb will of course show. The curbing is 6- x 18-inch sandstone set in concrete, and all corners will be of granite, and the radii at corners have been increased to 10 feet, which will greatly aid the turning of traffic in or out of side streets, which heretofore has been difficult and slow on account of the short 4-foot corners formerly used.

"The traction company has laid new 7-inch rail of 93-pound section on a 12-inch concrete base, with special work at the Square to obviate the former switching on certain lines. While this rail is a T-rail and does not accommodate paving as well as the girder rail which we endeavored to have specified in the franchise, yet by using a filler block under the head of the rail and a special beveled-edge block along the rail, a neat job should be secured. On account of the heavy trains of freight cars using these tracks at night, some of the city officials believed granite blocks should be used in the car tracks, but the abutting owners evidently believed vitrified brick would stand up under the strain, and these will be used. They are now being shipped, and every car-load is being tested for abrasion and absorption tests before they are allowed to come to Lima. Tests by a paving chemist have also been arranged for on the asphalt, both for the paving itself and for the filler between the bricks. Likewise, all cement will be tested.

"At eight places along this improvement, concrete safety islands will be built next to the car tracks for passengers. These isles will be 7 inches high, 42 inches wide and 25 feet long and will be so arranged that both interurbans loading at the rear and city cars loading at the front may be accommodated without making the islands too long. A concrete post will be built at the end with a red light warning traffic and white light for the platform. Mushroom red traffic lights will be placed in the center of all intersecting streets, and all these lights, as well as the lights in the new combination fire and police signal boxes, will be operated from the boulevard lights by a small invisible transformer. All wooden poles are being removed from Main Street, and the trolley wires will have small iron poles, which, with the boulevard lights, will be the only poles in this section. All light posts will be cleaned and repainted.

"Along each curb, a 6-foot apron or gutter will be built of vitrified brick. This will prevent the oils and greases dropped from parked automobiles, as well as surface water, from rotting the asphalt, which would occur if it were used at the curb. While it is hoped that this apron will never have to be disturbed, yet asphaltic joints will be used, which, should an emergency arise, could be burned out and the pavement removed without breaking it, as would be the result if a cement filler were used. The roadway between these gutters and the tracks will be 17 feet wide on each side. This will be 3-inch sheet asphalt, 1-inch binder and 2-inch top, all of lake asphalt. The contract price for the 3-inch asphalt on 8-inch base is $4.05 per square yard and for 4-inch brick on same foundation $4.50. Brick set on existing base in car tracks, $3.15. This being a repaving job, the city at large will pay one half the cost and the abutting owners the other half, the money being secured from bonds, and owners having ten years to pay in.

"All telephone, telegraph, power and similar ducts have been laid underground across intersecting streets, and properties will be served from the alleys parallel with Main Street. The gas lines have been renewed on each side of the street and new services installed, these lines being served by a 16-inch high-pressure main. Likewise, a new 16-inch steam heating main has been laid and all services renewed.

"One of the most thorough underground systems in the street is the city water lines. This work was part of the $300,000 program of main extensions and valve and hydrant insertions carried on during the past two years by this department. Formerly, a 16-inch main on the west side of this street served this section. An 8-inch line has now been laid in the east side and in this manner buildings are served from each main, and service lines do not have to cross under the car tracks and be eaten up by electrolysis.

"Furthermore, 27 large three-way hydrants have been placed in this section, and by having hydrants staggered on opposite sides connected to separate mains there need be no hose lines cut by trolleys. Nearly every property has been connected with a new 4-inch gated service, and many valves have been added and lines cross-connected. It was found that the three 16-inch valves in the Square had been broken and rusted shut for many years and the south side of the river was not being fed from the 20-inch main in High Street, but was actually fed by a network of smaller pipes in side streets. These have all been replaced with new valves, and the main line in the bed of the river at Main Street has been joined now where it was cut off and never relaid when the bridge was built several years ago.

"In all the subsurface work done by the various public utilities and city departments, costing in aggregate more than the paving will cost, there has been foremost in everyone's mind the fact that this work was to be of the very best and was to be designed to last and to be of sufficient size to care for this section of the city for at least 20 years, when, based on past growth, Lima will have well over 100,000 population."

Street Maintenance and Cleaning in Pine Bluff, Arkansas

Street Department Very Active in Public Improvements

FOR facility in handling and convenience in accounting, the forces of the Street Department of Pine Bluff, Ark., are divided into several groups. One outfit is equipped with two Fordson tractors, a grading machine and a street-sweeper. This outfit is charged with the duty of grading dirt streets, maintaining the gravel and macadam streets, and sweeping the paved streets. The possibility of covering all the dirt streets and caring for the graveled and macadam streets in any one year is beyond the limit of power of the machines, and when to this the sweeping of the paved streets is added, it can be understood why the Department feels that its work is never completed. Attempt has been made to care for the more important dirt streets and to sweep the pavements when it is most necessary.

In regard to street sweeping, Frank R. Allen, City Engineer, in charge of the Engineering and Street Departments, says that the Department of Street Sweeping is of much greater importance when the weather is warm and dust begins to accumulate in greater quantity. There is one very serious handicap which precludes proper cleaning and causes a great deal of delay and extra cost. This is the increasing practice of parking automobiles on the pavement over night. In a distance of 20 blocks, as many as 33 parked cars have been encountered between 1:00 and 6:00 A. M. In the business section, the leaving of cars over night is necessary and can be taken care of in a special manner, but the use of the residence streets, especially along thoroughfares, is an actual nuisance to the traveling public, and to the residents along the street, and an unnecessary hazard and obstruction in case of fire. It is a subject needing correction and is worthy of serious thought.

Early in 1924, the new "rolling hose line" was placed in service. This is an auxiliary to sweepers and increases the efficiency of the street-cleaning crew. In large measure it answers the purpose of a flusher.

During 1923, the city teams and trucks have hauled over 3,600 loads, or approximately 5,500 cubic yards, of refuse from the paved streets.

A second crew is known as the "sewer crew" and it spends practically all of its time working on the sewers. During 1923, an

PINE STREET, PINE BLUFF, ARK., PAVED WITH 2-INCH TEXACO ASPHALTIC CONCRETE BY THE KAW PAVING COMPANY, OF TOPEKA, KANSAS, IN 1915

average of 1⅔ estoppels per day were reported and cared for. One of the extraordinary causes for trouble was eliminated early in the fall when the wash racks from automobile garages were disconnected from the sanitary sewers. In one case in the up-town section, there were as many as four estoppels per week before the racks were disconnected. Since this has been done, a period of about four months, there has been but one stoppage for the entire period. The others are favorably changed proportionately to their importance. The sewer crew works on repairs to brick pavements and manholes during periods of rise in the river, when the high water makes work in the sewers impossible.

A third outfit, known as the "asphalt crew," devotes all of its time, when the weather is suitable, to the maintenance of the asphalt and other pavements that are patched with asphalt. When the weather is not suitable for this work, this gang is used with the teams for grading work or any construction that may be necessary.

A fourth outfit is the combination of hauling-equipment, consisting of teams and wagons and motor trucks. The work of this outfit is very scattered and is principally temporary maintenance. When the weather is suitable, the outfit is used as much as possible in making grades for sidewalk construction, cutting approaches to newly improved streets and picking up refuse after the street cleaners.

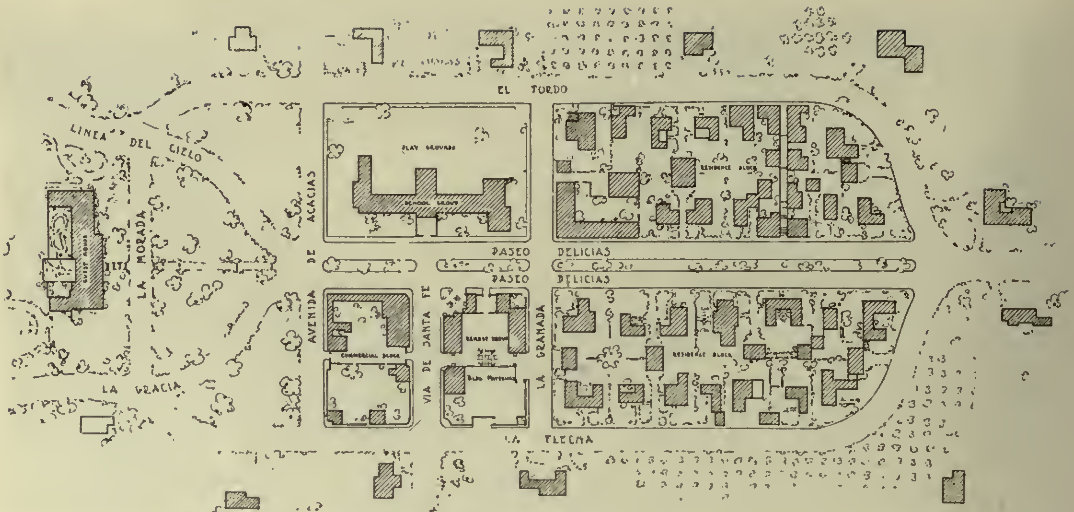
The Shop and Repair Department has functioned in the most satisfactory manner. It handles practically all the repairs of the street department along every line. In conjunction with the Shop and Repair Department, there is storeroom, and during the last year very few purchases were necessary other than the wholesale purchases made at the beginning of the year. In nearly every instance, the supplies held out and were adequate.

Preparing a New City Map

ABOUT sixty years ago a local land development company in Fernandina, Fla., prepared a map of the entire city on a scale of 1 inch to 400 feet. This map was revised from time to time, and accepted and approved by the manager of the development company as the official map of the city and so recorded in the county records, but there is no evidence on the maps of any acceptance or other action by any city officials. All the city had for its information and guidance was a well-worn lithograph copy.

In the last year new maps have been made by the city, one on a scale of 1 to 4,000, and another, in 8 sheets, on a scale of 1 inch to 100 feet. These are available for official use by all departments, and are sold to the public at cost. On blue-line cloth prints of the single sheet map, all houses and business buildings have been spotted and a separate mounted drawing prepared showing the relation thereto of sidewalks, improved streets, street lights, water-mains, fire-hydrants, fire-alarm boxes, garbage and trash collection customers, night-soil collection customers, electric light and power and water consumers and house numbers.

The different materials used in sidewalk and street construction, and the various sizes of street lights, water-mains, etc., are shown in colored ink. These drawings are the official eyes of the administration. Without them systematic and intelligent planning would be well-nigh impossible.



PLOT PLAN OF CIVIC CENTER OF RANCHO SANTA FE · DEL MAR CALIFORNIA
REQUA AND JACKSON · ARCHITECTS ·

An Exceptionally Planned Rural Community

By Lee Shippey

THE heartbreaking problem of many a city planner has been the mischief done before he was called in, the jumble of streets and houses which "just grew" when the community was young and which prove that "as the lane is inclined so the town is bent." Therefore it was with real satisfaction that delegates to the National Conference on City Planning in Los Angeles recently stopped off a day at Rancho Santa Fe, in northern San Diego County, California. For there the Santa Fe Land Improvement Company, a subsidiary of the Santa Fe Railway, has undertaken the task of creating a harmoniously beautiful and artistic community—one which will have nothing to undo.

Rancho Santa Fe is something new in America. It is not a town, yet has the modern advantages of a city. It is designed to accommodate only 400 families and their employees, yet it covers an area of 15 square miles and contains 53 miles of beautiful parked driveways. Its residents not only have the best of roads to drive over, but electric ranges to cook on; water piped to their doors with which to sprinkle their lawns and irrigate their orange and avocado trees; a well-planned civic center; and on every side surroundings which charm and invite and promise.

Yet it is not a millionaires' colony. It is self-supporting; it is, in fact, a fine example of what planning can do when it is called into service at the very beginning.

Rancho Santa Fe is a historic spot of much natural beauty. Conceiving the injustice of developing such an area in an ordinary way, W. E. Hodges of Santa Barbara, Vice-President of the Santa Fe, urged that it be made "the most perfectly planned community in America." Before any construction work was done, the possibilities of the area were studied by L. G. Sinnard, directing a staff of hydraulic engineers, soil experts, horticulturists, landscape engineers, community planners and architects. Every view of the sea, of the mountains, of sweeping upland or flowing valley was studied. Every commanding building site which would give the completed community somewhat the aspect of a beautiful chateau district along the northern Mediterranean coast was noted. A highway system was worked out with due regard for these considerations, and then the land was subdivided into tracts ranging from five to forty acres, in such ways as to make the most of every natural beauty and asset.

The next step was the preservation of that beauty. Architects noted as successful adapters of Spanish architecture were added to the expert staff, and it was decided that the exteriors of all buildings erected—outbuildings as well as residences, shops and filling-stations in the civic center as well as homes—must meet the approval of those architects. Not one inharmonious structure was to be allowed in an area of 15 square miles, designed to have about 2,000 inhabitants!

But the real aim of the Santa Fe was to work out a problem in rural life—to create a community which would demonstrate that rural life can be made more attractive than urban life. The Santa Fe also desired production. It was willing to spend a couple of million dollars on a demonstration project, but no matter how beautiful this project was at the beginning, it would grow shabby if it did not prosper. It might be attractive to men of wealth who wished country places, but that would not be solving a problem of rural life. The Santa Fe set its experts to work to assure community prosperity.

GARAGE, WITH SPANISH CORNER GARDEN, AT THE CIVIC CENTER OF RANCHO SANTA FE

Commercialism is disguised and beauty incorporated with safety for traffic in this manner

The Santa Fe was in no hurry. It spent several years in experiments and study and the coordination of plans. That was before the first road work was done, the first tract plotted. Before the building of the community actually began, the company was assured from demonstrations and studies that if only the fruits best suited to each tract were planted, and the care most certain to make them produce were given them, each of the four hundred tracts should yield an "annual safe income" that would mean a community of increasing, not waning, beauty and prosperity; of progress, not of idleness; of homes, not of mere retreats. And, incidentally, the Santa Fe would have thousands of car-loads of products to haul to market annually.

Therefore, one of the foremost horticulturists on the coast was made a member of the expert staff, and those who will not agree to develop their land in the manner surest to provide prosperity are discouraged from buying.

Rancho Santa Fe is a community whose development requires the backing of some such great organization as the Santa Fe Railway. Yet it is a community of real producers, open to the man of moderate means, as well as to the rich. Its residents have been and are being attracted to it by a high ideal, and its community spirit already commands the re-

THIS GASOLINE FILLING STATION AT THE CIVIC CENTER OF RANCHO SANTA FE IS ADMIRED BY MOTORISTS BECAUSE OF ITS CHARM AND DISTINCTION spect of all southern California.

John Nolen, the well-known city planner, declared on the occasion of the city planners' visit to Rancho Santa Fe that the project inspired him with a great hope. "There is a real need in this country," said Mr. Nolen, "for the community which does not dream of becoming a great city, but intends to be always a small but ever progressing rural community; within easy reach of city life, but forever aloof from it in the healthfulness and peace of the country, with the inspiration of growing things, fulfilling instinctive human yearning to make two blades grow where one grew before. This community, with certain modifications to suit other climatic and environmental conditions, may well become a model for a better, happier, lovelier rural America."

[EDITORIAL NOTE.—THE AMERICAN CITY hopes that the foregoing account of aims and achievements in Rancho Santa Fe may serve to impress railroads and other corporations and organizations elsewhere with the possibilities of the modern "farmer city" idea as a combination of good business and good civics.]

Cooperation Available in Rural Public Health Work

By L. L. Lumsden

Surgeon, U. S. Public Health Service

THE fiscal year ended June 30, 1924, has witnessed continued activity on the part of the U. S. Public Health Service in demonstration projects in rural health work. During the twelve months cooperation in such projects has been rendered in 70 counties, or districts comparable to counties, in 16 states.

The plan of the work was the same as that followed in each of the four preceding fiscal years. The appropriation for the support of this activity is "for special studies of and demonstration work in rural sanitation." In each demonstration project the rural sanitation work is made a part of a well-balanced, comprehensive program of health work and is conducted in cooperation with the state and local health authorities. The cooperation is offered upon the condition that whole-time local (county or district) health service be established. Part of the money (usually over 50 per cent) for the support of the work must be furnished from local governmental sources. The whole-time local (county or district) health officer, or sanitary officer, is given a status of field agent in the Public Health Service, and in some of the states a status of deputy state health officer, and serves as director of the demonstration project. He must present qualifications for the work acceptable to each of the cooperating agencies. The sanitary inspectors, health nurses, and any other assistants in the county health service, work under his direction.

By having the work conducted on such cooperative basis unnecessary overhead expense, friction, and lost motion are prevented. The average project presents a remarkable example of economy with efficiency in public business. All salient branches of health work, such as acute communicable disease-control measures, general sanitation of private homes and public places, malaria prevention, tuberculosis control, goiter prevention, infant and maternity hygiene, venereal-disease prevention, school hygiene, etc., are carried out. Attention is concentrated upon the different branches of the work in what appears to be the most advantageous sequence. The various activities are dovetailed with one another so that every dollar invested and every unit of energy expended may yield the biggest possible dividend in disease prevention and health promotion. By having the different branches of health work needed in the locality carried out under one director, with only one overhead expense, the cost is only a fraction of what it would be for equally effective work if performed by specialized field forces operating separately in each of the branches.

County or local authorities desirous of securing cooperation along these lines should make their requests to the Surgeon General, U. S. Public Health Service, Washington, D. C.; but before being forwarded to the Surgeon General, these local requests should be sent to the State Health Departments for approval.

EDITORIAL NOTE.—Available reports of special value on rural health work include:

Rural Health.—A 242-page symposium. Apply to American Country Life Association, Grand Central Terminal Building, New York City.

Fundamentals of Rural Health Work.—By W. F. Draper. 1924. 8 pp. Apply to Government Printing Office, Washington, D. C.

Health Administration in Rural Districts.—By Allen W. Freeman, M.D. 11 pp. In "Health News," New York State Department of Health, September, 1923.

Cooperative Rural Health Work of the Public Health Service in the Fiscal Year 1923.—By L. L. Lumsden, Surgeon, U. S. Public Health Service. 22 pp. In Public Health Reports, December 14, 1923.

Syphon Increases Available Reservoir Capacity

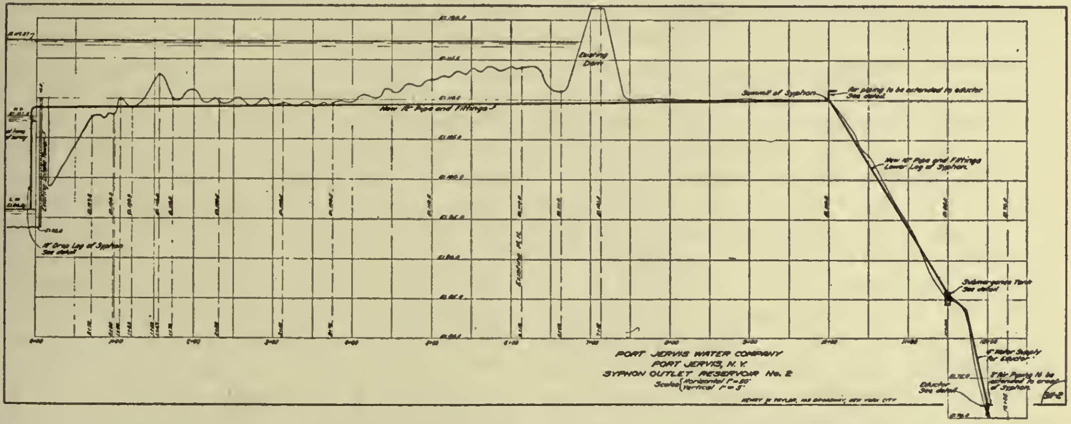
By Henry W. Taylor

Consulting Engineer, New York City

THERE are only one or two instances of reservoirs being drained by syphons operating under true negative pressure, lifting the water from the lower levels of a reservoir over a summit and discharging it into a ravine below. Because of this fact, readers of The American City will undoubtedly be interested in the design and construction of a new outlet for Reservoir No. 2 of the system of the Port Jervis Water Company, Port Jervis, N. Y., which was constructed last year and tested last fall.

The original outlet from the reservoir was constructed of standard cast iron pipe with lead joints. After entering the reservoir through a low dam, the line dropped to the bottom of a gate-house which extended to the low area of the reservoir, some 15 feet below the summit of the pipe. When full, the reservoir water-level flooded the original summit by about 9 feet of water. The old outlet operated successfully until the water had been drawn down to an elevation of approximately 3 feet below the crest of the pipe line, and then failed by reason of air leakage through the loosened lead joints or by taking air at the unsealed outlet. Repeated calking of these joints had only a temporary effect, and the result was that a volume of water about 14 feet deep and representing about 75,000,000 gallons was never available for use. On the other hand, to pump an equivalent volume of water represented an expenditure for power alone of not less than $2,500 per year.

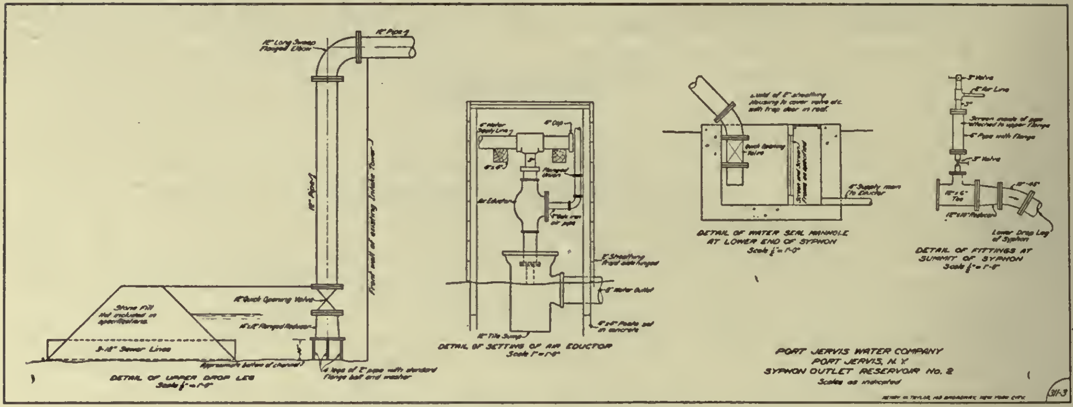
The writer was first consulted with reference to a tunnel outlet which would extend under the shallow section of the reservoir and reach the lower areas at a depth to allow a gravity flow of water to drain the reservoir. The character of the rock that would be encountered suggested that great difficulty might arise from opening seams in the rock bottom of the reservoir and providing opportunity for leakage which would be difficult to discover and repair. Comparative estimates also indicated that a syphon would be far cheaper if one could be installed which would involve no distant machinery to insure its continued operation.



Existing Dam
Summit of Syphon
New 10" Pipe and Fittings
Submergence Tank See detail
Eductor See detail
PORT JERVIS WATER COMPANY
PORT JERVIS, N. Y.
SYPHON OUTLET RESERVOIR No. 2
Scales Horizontal 1"=20' Vertical 1"=5'

PROFILE OF SYPHON AT RESERVOIR NO. 2 OF THE PORT JERVIS WATER COMPANY

The accompanying plans show in line form the general layout of the syphon as installed. Minor changes were made at the crest, and elaborate masonry structures were installed at the crest and the outlet of the pipe line. The syphon consists of 10-inch genuine wrought iron pipe with threaded joints up to the crest, where the size is reduced to 8 inches for the remaining 150 feet of the drop leg of the syphon. The crest was kept as close to the outlet as practicable and the drop leg made as short as might be and of a size to increase velocities and carry away as much


10" Long Sweep Flanged Elbow
10" Pipe
10" Pipe
Front wall of existing Intake Tower
Stone Fill Not included in specifications
10" Quick Opening Valve
3-18" Sewer Lines
Approximate bottom of channel
4 legs of 2" pipe with standard flange bolt and washer
DETAIL OF UPPER DROP LEG
Scale ⅛" = 1'-0"
6" Water Supply Line
6" Cap
Flanged Union
Air Eductor
6"x6"
8" Tile Sump
2" Sheathing
6" Water Outlet
DETAIL OF SETTING OF AIR EDUCTOR
Scale 1" = 1'-0"
Quick Opening Valve
4" Supply main to Eductor
DETAIL OF WATER SEAL MANHOLE AT LOWER END OF SYPHON
Scale ¼" = 1'-0"
3" Valve
Air Line
Screen made of pipe attached to upper flange
6" Pipe with flange
3" Valve
Tee
Reducer
Lower Drop Leg of Syphon
DETAIL OF FITTINGS AT SUMMIT OF SYPHON
Scale ½" = 1'-0"
PORT JERVIS WATER COMPANY
PORT JERVIS, N. Y.
SYPHON OUTLET RESERVOIR No. 2
Scales as indicated
311-3

DETAILS OF EDUCTOR AND SYPHON OUTLETS

air collecting at the crest from leakage or suspension as possible. In addition to the head required to overcome friction losses in the pipe for the required flow of about 2,000,000 gallons per day, there was excess head available for the installation of a Schutte-Koerting air ejector operated by water flowing from the outlet of the syphon. The syphon discharge is, in other words, sent through a second drop to operate an air ejector, which maintains a vacuum of about 19 inches at the crest of the syphon.

The new outlet is also flooded when the reservoir is full, and the syphon starts itself without priming. The complete cycle of a year's operation of the syphon may be described as follows: The reservoir fills in the spring and floods the outlet by 9 feet at the crest. When water from storage is required, the outlet valve of the syphon is opened and gravity flow takes place. Part of the flow from the outlet passes through a screen and into a 4-inch pipe leading to the ejector below. Should subsequent rains render the use of stored water unnecessary, the outlet valve is shut down, but not completely closed, unless the water-level is still above the crest of the outlet pipe, and sufficient water is allowed to flow through the syphon to supply the ejector and maintain the negative pressure at the crest. The outlet is then always ready for full use without priming and without machinery of any kind. Late in the fall and just before the closing in of the winter season, the syphon is used to draw all of the water available from the reservoir and is allowed to break from the inlet end of the pipe. The pipe line is then drained and vented at the crest and left for the winter.

Construction

In laying the pipe, all joints were made up so that no thread was exposed at the couplings. At minor angles in the line, adjustable couplings, made on the order of a dutchman flange, were used. By rolling these flanges on themselves, a deflection of the desired amount could be obtained up to 16 degrees. Two expansion joints were set in the line, and the pipe was anchored at several points. Outside the reservoir, the pipe line is above ground for some distance and is supported on concrete piers and anchors. A quick-opening valve was provided at each end of the syphon to facilitate the first starting of syphonage, when the syphon was pumped full of water and the valves opened simultaneously. The lower end of the syphon was water-sealed, which was not the case with the original outlet pipe. All of the piping was given two coats of asphalt roofing paint.

In the course of construction, a 14-foot cut was made through the old dam in zero weather, the banks being allowed to freeze as the work progressed, so that no bracing or sheathing was necessary. The frost was removed as the backfilling started, and the removed dirt was kept under straw, so that only a thin layer of it was not usable as back-fill. The line was tested out with practically no leakage, and the ejector does very little actual work but is a surety against accumulating trouble at the crest with eventual breakage of the syphon.

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Road-Maintenance Problems

Results of an Investigation and Study of Seven Different Road-Maintenance Problems

THE Maintenance Committee of the Advisory Board on Highway Research, Division of Engineering, National Research Council, during 1923 made an investigation and study of seven different road-maintenance problems, some of which are reported in abstract below:

Gravel Corrugations

Dr. George E. Ladd, Economic Geologist for the U. S. Bureau of Public Roads, has made a study of gravel corrugations. Questionnaires were sent to all the highway departments in the United States, and replies were received from 32 states. The consensus of these replies was that corrugations form in all gravel roads when the traffic becomes 500 to 600 vehicles per day. The formation of corrugations is in no way dependent upon construction or maintenance methods. Corrugations are most apt to occur on flat grades. Two general reasons were assigned for the formation of corrugations: first, actual kick-back of material due to the spin of the drive-wheel returning to the road surface after a bounce caused by an unevenness in the surface of the road; second, displacement of material due to impact of the wheels, both front and rear, after the bounce. This displacement is accentuated in rainy weather by the splashing of water, which carries away the binder and fine material from the corrugations.

Do Your Problems Include:

Gravel Corrugations?
Surface Treatment of Gravel Roads with Refined Tar?
Dust Prevention with Calcium Chloride?
Sizes of Mulch Gravel for Maintenance?
Crack-Fillers for Concrete Pavement?
Maintenance Accounting?
If so, read this article.

Any slight unevenness of the road which reacts on the springs of passing cars may cause a series of corrugations. When the unevenness is hit by a passing car, the springs are at first depressed; they then expand and virtually lift the weight of the car from the road. In some cases the wheels of the car actually leave the road surface; then the springs come back to normal, and the weight of the car is impacted on the road surface. If the road is wet, a slight indentation is made; also, as the drive-wheels are spinning, material is kicked back from the point of contact, and a depression is thus started. After this depression has started, it grows rapidly and other depressions are formed in a similar manner until we have a complete series. On flat grades during rains the depressions collect the water which is splashed out by passing vehicles, taking with it quantities of road binder and fine material.

The states were almost universally agreed as to the method of cure of corrugations: blading or dragging with heavy equipment soon after rains, while the gravel is still moist, supplemented by occasional scarifyings, seems to have produced the best results. It should be noted that this cure is not permanent, but lasts only until the next rain.

Surface Treatment of Gravel Roads with Refined Tar

The Michigan Highway Department has continued its research in this subject through the year and has surface-treated with refined tar approximately 45 miles of well-constructed gravel roads carrying a traffic of from 800 to 1,500 vehicles a day. The method of surface treatment which they have adopted is, briefly, as follows: The work is started early in the spring, when the frost is coming out of the ground. The road is first shaped up and the gravel allowed to consolidate. As soon as it is fairly well dried out, it is swept and an application of 1/6-gallon of a refined tar per square yard is applied and allowed to penetrate into the surface. As soon as the surface takes on a brown appearance, approximately ⅓-gallon per square yard of the same cold material is applied and immediately given a top dressing of pea gravel or slag screenings. The Michigan Highway Department emphasizes the fact that the success of this kind of work depends largely upon the maintenance given the road, both before and after the treatment. Surface breaks are taken care of as fast as they occur. They are filled with a cold mixture of refined tar and coarse gravel. These patches are struck off and smoothed with a flat-bottom shovel.

The Wisconsin Highway Commission has also treated a large mileage of gravel roads with refined tar, and reports satisfactory results. The Wisconsin method of treatment is similar to that used in Michigan. The road is first scarified and smoothed and allowed to compact. It is then swept and an application of cold tar applied from shoulder to shoulder, 1/6-gallon per square yard. The road is then opened to traffic for 24 hours and ⅓-gallon of cold tar per square yard applied and lightly sanded, using about 15 cubic yards of sand per mile for a 20-inch width. The travel is then allowed to use the road and in a few days a second sand coat is applied, using about 35 cubic yards per mile for a 20-inch width.

For patching, a tar mastic is prepared and allowed to stand in piles along the side of the road. About 17 gallons of cold tar per cubic yard of sand is used in preparing this mastic.

Dust Prevention with Calcium Chloride

The Michigan Highway Department has experimented with calcium chloride and light oils for dust prevention on gravel roads. The results with both have been satisfactory. They report the following points to be of great importance in calcium-chloride treatment: The chloride should be applied while there is still some moisture in the gravel, and the application should be in the neighborhood of from ½- to 1 pound per square yard, giving a light treatment which will help avoid future trouble. The application should be uniform over the surface. The road should be left free from all lumps or piles of chloride. Ordinarily, three applications during the season is sufficient, but the second or third application should be made before the former application of material is entirely gone. In other words, there should be a little overlap rather than a dust interval. Care should be exercised in varying the amount to be applied to the different roads or sections of roads, inasmuch as shaded portions as well as sand or clay gravel have much to do with the quantity of chloride that should be used.

Sizes of Mulch Gravel for Maintenance

Nearly every state is now maintaining most of its gravel road mileage with a mulch treatment of gravel. Various sizes and amounts are used. Little published information is available on this subject. The Michigan Department recommends the following: Replacement material should be limited to not exceeding 1 inch in size, preferably ¾-inch, with about 60 to 75 per cent of the material being retained on ⅛-inch mesh. The clay content should be held down to not over 5 per cent, and the filler should be substantial material which will help get away from the dust nuisance. The mulch should be applied in very light courses, not exceeding one inch in depth at any time, and should be applied preferably late in the season or during the spring months.

Crack-Fillers for Concrete Pavement

Nearly every state and numerous municipalities are experimenting more or less with various tars and asphaltic fillers for the repair of cracks in concrete pavements. A few years ago there seemed to be a demand for a light-colored filler which would harmonize with the color of concrete pavement and thus be less noticeable than the black tars and asphalts. A satisfactory light-colored filler at a reasonable price has not been developed. The Committee of the Advisory Board on Highway Research is inclined to believe that public sentiment on this question is changing. As the mileage of concrete roads increases, the public becomes familiar with maintenance methods and does not look upon the black streaks with the horror that it did a few years ago. Furthermore, on heavily traveled pavements the oil and grease droppings from cars soon stain the pavement until the black crack-fillers are not conspicuous.

One of the most extensive tests of crack-fillers is being carried on by the Iowa Highway Commission on a concrete road immediately outside the city of Des Moines. On this experiment three tars, nine asphalts and blown oils, one emulsified asphalt and one light-colored material were used. The experiment has only recently been started. One barrel of each material has been applied and is now being tried out in service.

Maintenance Accounting

The Mississippi Valley and the American Association of State Highway Officials have committees at work undertaking to develop a feasible uniform system of maintenance accounts, so that maintenance reports of various states may be put on a comparable basis. The following report was adopted by the Mississippi Valley Association, and these states are attempting to make their accounting conform to the general classification.

"Expenditures by the states, through their maintenance organizations, shall be classified in their annual reports as follows:

1. Maintenance administration
2. Maintenance proper
3. Additions and betterments
4. Parks, camping-grounds and roadside beautification

"The last three classifications shall be changed to a specific section of road.

"Additions and betterments shall include expenditures for the increased permanent value of the road to accommodate traffic. This will include the cost of

1. Increased width of surface or road-bed
2. Increased depth of wearing surface over any previous maximum depth
3. New guard-rails
4. New walls
5. New drainage structures and watercourses
6. New subdrains
7. Improving grades, alignment and vision"

Wisconsin has adopted the following classification:

1. Maintenance administration, covering general office overhead
2. Maintenance supervision, covering district office overhead
3. General maintenance, covering patrol and repair work. This cost is kept by patrol sections
4. Reconstruction; covers replacement to restore to original condition. Cost kept by patrol sections
5. Additions and betterments; covers expenditures which change the section of the road and produce increased capital investment
6. Marking and signing; covers maintenance of all traffic guides on the state system

It will be noted that these classifications can be consolidated to conform to the four main divisions of the Mississippi Valley State Highway Officials report.

When maintenance costs are kept in a uniform manner by the various states, it will be possible to make comparisons of such costs. This, however, is only the first step toward uniform maintenance reports. Maintenance reports, even though summarized from uniform records, are not of the greatest value as long as they are based on a per-mile cost. The next step is to reduce such costs to a ton-mile unit; then useful comparisons between states and between types can be undertaken. This, of course, involves traffic census data, which must be secured at regular intervals and in a uniform manner.

Parking Facilities for Industrial Employees

REALIZING that city governments cannot be expected to furnish parking space in the streets for the increasing number of automobiles used by employees of large industrial plants in getting to and from their daily work, the heads of such industries are giving more attention than heretofore to the solution of this problem. A plan just instituted by the C. L. Best Tractor Company, of San Leandro, Calif., is of interest in this connection.

This company has purchased property adjacent to its plant and has constructed a private parking station for the exclusive use of its employees. The parking station has an area of 35,000 square feet and will accommodate 150 machines. Stalls for 80 machines have been erected and wash-racks installed where employees may clean their machines. The structure to house machines incloses the station on three sides, and an iron fence and gateway are built on the fourth side.

An attendant is in charge of the station for the purpose of directing car owners to their proper stalls and protecting machines against possible automobile thieves.

It has been figured that the station will save from $50 to $100 per year for each car owner, as annual depreciation on automobiles standing out of doors in all kinds of weather ranges between these amounts.

Heretofore machines have been parked on both sides of streets surrounding the plant, adding to the danger of automobile travel through the district and making more difficult ingress and egress at the factory.

PARKING SPACE FURNISHED FOR EMPLOYEES BY A LARGE INDUSTRIAL PLANT IN SAN LEANDRO. CALIF.

Play Space on New York's Water-Front

By Charles J. Storey

NEW YORK has about two hundred miles of water-front on its rivers, bays, ocean and sound. No other city in the country has as great a water-front, and possibly no other city has as great a need for utilizing a reasonable amount of it for the recreation of its inhabitants.

Of this water-front, 25 miles have been devoted to public parks. About 44 miles are in factories, docks and other commercial uses. With the increased use of the water-front for commercial purposes, it is also becoming more and more recognized that the benefits to the city of water-front parks, boulevards, beaches and playgrounds are tangible and concrete.

The Recreation Survey of the Regional Plan of New York and Its Environs undertook to discover how the water-front of Greater New York was being utilized. The following map and table give a bald idea of what was found. They do not tell of the crowded commercial parks and beaches, as those on Staten Island, where not a foot of the water-front as yet belongs to the people. And from 59th Street on the East River and all along the Harlem River are thousands of pleasure launches belonging to boating enthusiasts, anchored along the wharves and by improvised shacks, and boat-houses. Only a small proportion of these launch owners belong to boat clubs, and every cove and bay, no matter how small and how covered with refuse its shores are, is eagerly utilized as an anchorage. Nor does the table tell of the hundreds of people who live in shacks and tents and on house-boats in the summer, around the water-front. Even Manhattan has these campers along its crowded waterside. This is the human side of the water-front which we are apt to forget when we think of it only as a commercial asset to the city.

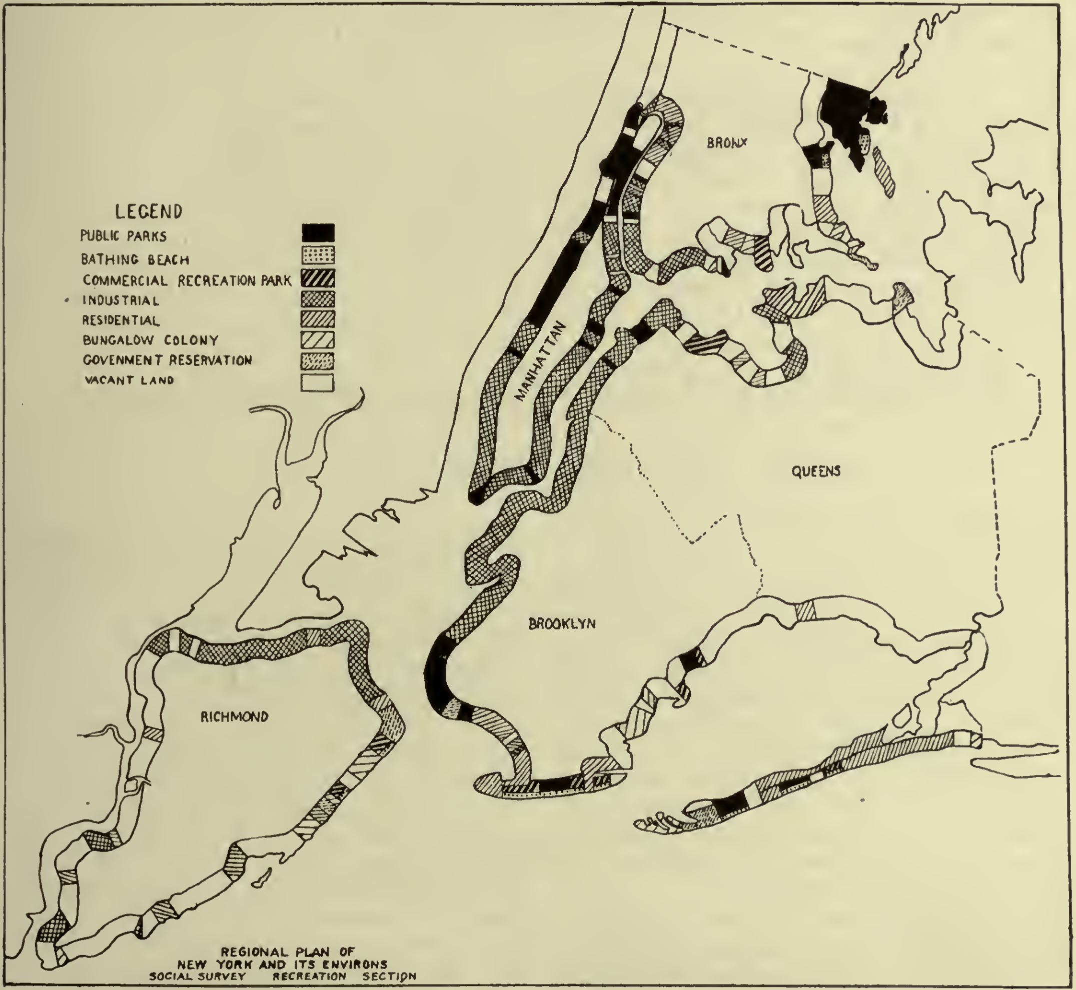
It is through the parks that most of New York's citizens enjoy its waterside. Manhattan has already been more generous in saving its water-front for park space than other boroughs. Nearly one-third of its entire frontage on the East, Harlem and Hudson Rivers is in parks. Riverside Park on the Hudson and High Bridge Park on the Harlem are the longest stretches, although there are a number of smaller and more intensively used parks on the East River. Riverside Park

THE GOOD AND THE BAD ALONG THE MANHATTAN WATER-FRONT

1. Battery Park, one of the most intensively used parks on the Manhattan water-front. 2. John Jay Park, East River at 77th Street, one of New York's beautiful small riverside parks. 3. Shacks and boat-houses on the East River at 122nd Street. 4. Hudson River at West 47th Street—off the dock

has always been separated from the water's edge by the tracks of the New York Central freight line, but plans are under way to cover these tracks and extend the park actually to the river's edge. When this is accomplished, New York will have one of the largest and most beautiful riverside parks in the world.

The Bronx has nearly as much park land on the water-front as Manhattan, except that most of it is in one park, the extensive Pelham Bay Park on the Sound. The borough of Queens, with the longest water-front of any borough, has 3½ miles of park on the water, or about 7 per cent of its length. Brooklyn's large parks are almost all inland, so that only 4 miles out of a water-front of 36 miles is park property. But Brooklyn has rescued several miles of beach at Coney Island by erecting a boardwalk and building a wide beach beneath it, so that its play space is really larger than just that allotted to parks. The city is also about to acquire 50 acres on Plum Island in Jamaica Bay for a bathing-beach and park. This will be the first municipal



PRESENT USE OF WATER-FRONT AND APPROXIMATE LENGTH AS MEASURED IN MILES ON ACCOMPANYING MAP

	Manhattan	Bronx	Brooklyn	Queens	Richmond	Total
Public parks	9¼	8½	4	3½		25¼
Commercial recreation parks		½	3	1½	1	6
Industrial	15¾	3½	11	5	8½	43¾
Residential		4½	6¾	11	3¾	26
Bungalow colonies		2¾	2	4¼	2¼	11¼
Government reservations		2	¾	2¼	1½	6½
Vacant land	4	16¼	8½	24½	19	72¼
	29	38	36	52	36	191

bathing-beach on this beautiful bay.

Staten Island, with only about half its water-front built on, still has no public parks, or any land reserved on the water for the use of its citizens. It has nearly 15 miles of beautiful beach, but at present there is not one place where the general public has free access to it, as it is entirely in private hands.

Until recently New York had for the recreation of its 5½ million inhabitants about 2 miles of public beaches. With the taking of the beach at Coney Island from private hands and with the expected improvement of the beach at Jacob Riis Park at Rockaway, and also with the building of a boardwalk along the rest of the Rockaway shore front, we shall have nearly 9 miles of bathing-beaches. Any one who has seen the hundreds of thousands of men, women and children who overcrowd the existing beaches on any warm Sunday or holiday in summer, will realize that even 9 miles of ocean beach is not too much.

One indication of the recreation value set upon the shore front by the citizens of New York is shown by the 11 or more miles of summer bungalow colonies which have sprung up on the two bays and the ocean in the last few years. These colonies are often located on leased land and are temporary in character. Numerous families migrate each summer from all parts of the city, including the East Side and the poorer sections of all boroughs. Many of the bungalow colonies are nothing more than camps where everybody lives all day out of doors on the beach in a bathing-suit.

Tent camps are to be found all along the water-fronts outside of Manhattan. These are, of course, temporary and many are simply "squatters" who pitch a tent for a few weeks. In Pelham Bay Park, the Park Department has assigned some acres by a beach for campers who come year after year. At Rockaway private camp sites are rented near the water. Most of these are very crowded, having dozens of tents on small plots closely placed together. Although bath-houses are prohibited on the East River because of the pollution of the water, one may see any summer day, along the wharves of Manhattan, swarms of boys, and in some places girls and women, bathing in water so dirty that the only favorable thing to be said about it is that it is cool and wet.

Baltimore's Civic Opera Experiment

By Amalie Sonneborn

INTEREST in opera in many parts of Europe has reached that state of importance where every city of any size and cultural significance can boast of a local opera company. In America, on the other hand, opera has been largely an imported affair, and with rare exceptions the casts of the big opera companies are made up of singers gathered from the four corners of the earth, who have received their formal training on some foreign stage and have emerged into the realm of stardom abroad before being acceptable in the sight of the American public. There is small field for the development and training of opera singers in America at present. It was in recognition of this lack that a plan was put into execution in Baltimore during the past season that is capable of great development in the direction of the establishment of a local opera company, which will give local talent a chance to be heard and to receive something of the formal discipline that appearance as a professional carries with it.

The plan for the Baltimore Civic Opera was originated by Baltimore's Municipal Director of Music, Frederick R. Huber, whose able leadership in local musical matters has the hearty support of Mayor Howard W. Jackson, and the city administration. Through Mr. Huber's efforts the Baltimore Symphony Orchestra came into being, which, because of the low price of its tickets, makes good music available to all. During the past season he arranged for the Orchestra to give two Children's Concerts, and this experiment proved to be so successful that these concerts will become a regular part of the Symphony Orchestra's yearly program. For next season Mr. Huber is laying plans for a civic chorus, which will consist of an amalgamation of all the different choral societies of the city, for two or three great performances; and at some future time, when the interest in music shall have become more sophisticated, he feels that the establishment of a Manuscript Society for the encouragement of original composition will be possible. So, in January, when George De Feo made it known that he was going to bring his opera company to Baltimore for two weeks in May, Mr. Huber suggested that on one night each week Mr. De Feo substitute local singers for the singers in his company in the principal roles, and the New York impresario, seeing the possibilities of the plan, decided to adopt it.

According to Mr. Huber's plan, the singers were to be chosen by a Casting Committee, which was also to choose the operas to be given on the Civic Opera nights. A committee was therefore appointed, so selected that each member would represent a different musical group. It consisted of Harold Randolph, Director of the Peabody Conservatory of Music; Mabel Garrison, formerly with the Metropolitan Opera Company; George Castelle, cantor at one of the leading synagogues and Director of the Meyerbeer Chorus; Frederick M. Supplee, representing the Metropolitan Club; and George De Feo. Mr. Huber, feeling that the opera was a civic rather than a municipal project, promised his support, but withdrew from active participation, and the plan also had the hearty support of the Mayor, who has been ever willing to aid all cultural movements that will enrich the life of the community.

Measuring the Amateurs Against the Professionals

The committee decided that on the first night of Civic Opera "La Bohème" would be performed, and for the following week "Cavalleria Rusticana" and "Pagliacci" were selected for production. On the first night of Civic Opera only the principal roles were to be performed by local singers, and the supporting cast was to be recruited from the professional company. This would force the amateurs to measure themselves against professionals, but it might lead to a somewhat uneven performance. This drawback would be obviated on the second Civic Opera night, when the entire cast was to be made up of local singers, and only the chorus was to be professional. Each plan had its merits and demerits, and each deserved a trial.

The rules drawn up for the audition, at which the singers were to be selected and cast in their parts, were designed to insure strict impartiality, and were published in newspapers and posted in places where they would be brought to the attention of those interested in competing. The singers who wished to be heard at the audition, which was to be held at the Lyric Theatre on Saturday afternoon, March 1, were to send in their names to Mr. Huber in advance, stating whether they would bring their own accompanists or whether they wished to make use of the accompanist appointed by the committee. The names of the contestants were not revealed to the members of the Casting Committee.

The audition proved to be a most interesting affair. The contestants, who were relegated to the back-stage, each drew from a hat, gallantly lent for the occasion, a number which indicated the singer's place in the audition; while the members of the committee, each armed with a set of numbered cards and a pencil, disposed themselves in different parts of the auditorium to listen and make notes. The accompanist announced "Number One!" and the audition was on. Then in rapid succession the singers followed one another, some alone, and some singing duets, each performing an aria from an opera, using the proper gestures, and singing until the committee signaled the contestant to stop. In an hour and a half all the eligible singers, numbering over thirty, had been heard, and the committee withdrew to make its selection. In cases where opinion was divided the singers were called by number to perform once more. The following day the casts for the Civic Opera, as decided upon by the committee, were made public.

Ten weeks later the Civic Opera cast with the De Feo Opera Company performed "La Bohème" and the following week gave "Pagliacci" and "Cavalleria Rusticana." The performances were highly creditable. The singers had been coached by George Castelle, and Mabel Garrison had kindly offered the use of her studio for frequent rehearsals and stood by to make pertinent suggestions. When the De Feo Opera Company came to Baltimore, the orchestra leader went over the operas with the local singers, but it is to be regretted that there was no opportunity for a full-dress rehearsal with orchestra, chorus and costumes. In spite of this disadvantage, the operas were very well done, and the singers, appreciating the value of this rare opportunity, made the most of it. It gave them a taste of professional discipline which showed itself most clearly in the unfaltering tempo with which the performances were carried through, a decided contrast to the tendency to drag which is the most frequent characteristic of the amateur production. A fine cooperative spirit among the singers was noticeable in these performances, which augurs well for the future of such joint efforts. The audience, on the other hand, enjoyed the opportunity of hearing what Baltimore singers could do in a professional way.

The Baltimore Civic Opera was a modest effort, but a highly significant one, and the fact that the plan was immediately copied in

Winston-Salem is an indication of its fruitfulness. It lays the foundation for a more permanent structure whereby American singers can get operatic discipline and experience without having to go abroad, and it gives the public an opportunity to hear opera creditably performed at a low price, which elaborate productions presenting "stars" make quite out of the question. This experiment, though carried through on a small scale, very surely writes Baltimore's name into future histories of the progress of American culture.

Municipal Band Concerts in Pittsburgh

By H. Marie Dermitt

Secretary, Civic Club of Allegheny County

FOR the eighth year band concerts are being held this summer in the parks of Pittsburgh under the supervision of the Civic Club of Allegheny County. Two bands are employed. One, composed of 30 men playing under the baton of D. V. Nirella, presents 37 concerts in the large parks from July 6 till August 17. The program is changed twice a week. The other band, of 16 men under the direction of Charles Passetti, gives 25 concerts in smaller parks, making a total of 62 concerts presented in 25 districts.

Municipal band concerts are given in a greater number of districts in Pittsburgh than in any other city in the country. An appropriation of $10,000 for actual band expenses and $1,000 for miscellaneous expenses is made by Council. Miscellaneous expenditures include the salary of the choral leader, lantern, lantern slides, song sheets, transportation of the portable band-stand, and various other items. The Civic Club donates the personal supervision of the executive and assistant secretary, the services of a stenographer for eight weeks, postage, stationery, telephone messages and supervisors' badges.

A high standard of music is maintained. Jazz is strictly prohibited. Politics do not enter into the careful selection of bands. Community singing, especially in the smaller parks, is one of the most animated parts of the evening concerts. Foster melodies, folk, sacred, patriotic and the better popular songs make up the programs.

Each concert is attended by a representative of the Civic Club, who reports on the performance of the band and the effect of the music on the audience. A "good order" squad is made up of local boards of trade and other prominent citizens.

The Civic Club has the hearty cooperation of all local newspapers in spreading the message of the municipal concerts. The five large dailies print the program in full on the front page, and editorial and supplementary articles give splendid prominence to this municipal undertaking. The twenty or more weeklies and dailies issued in all sections of the city and outlying districts are also most generous in their support of the municipal concerts. Libraries use programs on their display boards and accentuate the announcements by special notices placed in the lobby of the main entrance, calling the concerts to the attention of new borrowers and visitors from out-of-town.

The large attendance and the wholesouled, rapt attention of the audience is a daily expression of appreciation to the city for the free municipal concerts.

Community Advertising Has a Setback in England

COMMUNITY advertising received an unfortunate setback in England recently. The Corporation of Kingston-on-Hull made application to Parliament for power to levy a two-cent rate on the ratable value of the city. This was estimated to produce $12,500 annually. The Secretary of State, however, threw cold water on the idea like this. He said he "submitted that the proposal that local authorities should have powers to spend money on advertising the industrial advantages of their districts is much to be deprecated, as it would be impossible to refuse to one authority a power of advertising which had been granted to another, and the competitive advertising which would result would give no advantage to the country at large, while it would involve a considerable and needless expense of public money."

To put it mildly this view-point of the Government on modern advertising is amazing and more is likely to be heard of it. The Rt. Hon. the Lord Mayor of Hull, a keen advocate for judicious publicity, is expected to address the convention on the subject. The Health Resorts and Watering Places Act, 1921, gives powers to pleasure resorts to use profits from municipal ventures up to four cents in pounds on ratable value, but this privilege for industrial centers is taboo.

—*Associated Advertising,* July, 1924.

SOME OF THE 1,525 CHILDREN WHO ATTENDED A SATURDAY MORNING MATINEE AT THE IMPERIAL THEATER, JACKSONVILLE

Children and the Movies

By Jason S. Joy

Executive Secretary, Committee on Public Relations

ALMOST since the very establishment of the motion picture as a means of public entertainment we have all heard the question:

"What about the movies and our children?"

Likewise we have all heard the assertion:

"There are a great many pictures that our boys and girls should not see."

The question is important. The assertion is true. What, then, are we going to do about it?

The first thing to do, it seems to me, is to look the situation squarely in the face. It is worthy of serious thought, and should have an altogether fair consideration.

It is a simple thing (perhaps it is simple in both senses of the word) to say: "Make all pictures of such a character that we need feel no hesitation in allowing our youngsters to view them." That, of course, can't be done, if the making and showing of movies is to go on—and certainly we don't want them to cease. For if every picture were fitted to the adolescent mentality, if no picture contained those phases of life which interest us grown-ups though they may not be entirely fitting for juvenile thought, we of more mature age and experience would quickly stop our visits to the picture houses. And if the producers and exhibitors had to depend upon children for their patronage they would not long remain in business.

There must always be pictures which are not intended for adolescent observation, and every thoughtful person will accept that situation. So let's stop urging that the fault in the matter of "children and the movies" rests wholly with those who make and show the movies.

I contend that we parents, we teachers, we custodians of the welfare of children, have a much more distinct and definite responsibility than many of us have chosen to admit. There are innumerable novels which we read, but do not place in the hands of our children. There are many stage-plays which we might hear, but to which we would scarcely take the aforesaid youngsters.

What do we do in these matters? We exercise some supervision over what they read or hear. Why, then, shouldn't we do the same thing in respect to the motion pictures which they go to see? That is a much more difficult matter, I will admit. The movies are more accessible, more easily within the reach of the juvenile spending-allowance, than the novel or the stage play. And, it might be added, they are more appealing to the youngsters than either of the other forms of entertainment.

But the difficulty of the task does not lessen our responsibility. Parents and civic leaders can, at least, learn from our children the frequency of their attendance upon motion pictures, and the type of pictures they care best to see, rather than sit by in idle ignorance of their habits in this regard. The children can be taken, or sent, to the higher type of picture, of which there have been developed within the past few years a really large number. And as these better pictures receive better support from the public—from adults and children both—more and more of them are being made, for the producers are learning that this is the sort of picture the public wants.

Legislative Attempts to Solve the Problem

In some parts of the country efforts have been made to place the responsibility for juvenile movie-attendance upon the state. That is to say, laws have been passed setting age-limits, under which unaccompanied children might not be admitted to picture houses. In New York State, no child under 16 may enter without parent or guardian; in Massachusetts, New Hampshire and Pennsylvania, no child under 14; in Rhode Island and Connecticut, no girl under 16 or boy under 14.

But this hasn't worked out with any degree of success.

The New York law has been a distinct failure. In the first place, it has been easy for a child under the legal age-limit to hail a good-natured adult, hand over a coin and say: "Take me in, Mister?" or "Take me in, Lady?" Worse yet, some of the cheaper and smaller houses have actually employed adults for this very purpose; and others have admitted children without question and then simply "squared" the inspectors whose duty it is to look for violations of this law. It has been more or less easy, again, for the youngsters to misrepresent their ages.

There is still another angle to this attempt at having the state solve what problem may exist as to the child and the movies. It is a definite shirking of parental duty, just as censorship is a shirking of individual duty by placing the responsibility for the kind of picture we see in the hands of a few political appointees.

An Organized Effort to Raise Motion Picture Standards

A splendid organization of men and women is now engaged, in this country, in an effort not only to improve the general standard of motion pictures, but to do whatever is possible toward looking after the relationship between the child and the movie.

This is the Committee on Public Relations, which cooperates with twenty great concerns making and circulating films, guided by Will H. Hays, as president of the Motion Picture Producers and Distributors of America. These firms make about 90 per cent of all pictures created in this country, and this country makes 90 per cent of all the world's films.

The Committee, formed at Mr. Hays' invitation, includes representatives of sixty-odd betterment organizations with nation-wide membership. Its activities reach out to some 30,000,000 citizens. It includes such organizations as the Mothers and Parent-Teachers Associations, the General Federation of Women's Clubs, Boy Scouts, Y. M. C. A., Y. W. C. A., American Federation of Labor, American Legion and others. The American City Bureau is also a member of the Committee on Public Relations.

With regard to children and the movies, the Committee is trying an extremely interesting experiment. This is the Saturday morning matinee for young people. It operates in this fashion:

A program is arranged, not of babyish fairy-tales nor goody-goody stuff which long ago used to be considered the only style of material suitable for youngsters, but of live, active, amusing, entertaining pictures—some of them, indeed, which have proved successful when shown before adult gatherings. Parents are informed that their children may see such programs as arranged by the Committee, without harm of any sort, and, indeed with actual benefit. The admission-prices are low, generally being set at ten cents. The theater-owner cooperates, because he realizes that here is his next generation of patrons. For him these matinees are not intended as money-making enterprises. Sometimes there is a little profit over the actual operating cost.

Now, there are several excellent reactions from this plan. In the first place, the young people, having seen one program, are not so likely to demand that their elders take them to night performances during the rest of the week. That pleases the parents. Next, the young people are being made into "movie-fans" —which pleases the theater-owner. But best of all, the young people are taught to appreciate the really high-class sort of picture—and having acquired that taste in their youth will continue it as they grow up. And this should please all of us who not only have our children's welfare at heart, but who are desirous also of seeing the motion-picture, wonderful instrument of enlightenment as well as of entertainment, move steadily forward in achieving its limitless possibilities.

Saturday Morning Matinees in the Southeast

The most ambitious experimentation along this line—and one which shows clearly that civic organizations may participate helpfully in the plan—is being conducted in the Southeast under the guidance of the Atlanta representative of the Committee of Public Relations, De Sales Harrison.

Saturday morning matinees have been conducted in that region for about two years. The "key cities" where they are given include the following: Atlanta, Chattanooga, Memphis, Jacksonville, Birmingham, Montgomery, Charlotte and Columbia. These showings are a permanent part of the community life of those cities and of many smaller towns.

In many instances such organizations as the Rotary, Kiwanis, and Lions Clubs gladly take a share in the entertainment of the youngsters by sending to the theater their quartettes, their minstrel men and the like. Also, they assist toward the success of the morning showings by spreading word of them throughout their membership.

In twenty-three southeastern communities the Saturday matinees are operating with regularity and in as many others occasionally. The children who attend them are usually between twelve and sixteen years of age. They are not shown "baby pictures," by any means. The Committee places before them good action stories which at the same time are free from the sometimes questionable problems of maturity. The pictures of Thomas Meighan, for example, are shown with great success, also those of Harold Lloyd. Whatever the main feature may be, it is always accompanied by a two-reel comedy.

The plan has received splendid support from municipal officials in the southeastern communities, and likewise from the newspapers, which in many places print in advance the program to be presented.

The motion picture exhibitor, it seems to me, should have a really definite place in community life, just as the clergyman or the newspaper editor has, since he, like they, is called upon for something which the people need and want. Through the Saturday morning matinees many exhibitors in the Southeast are going far toward achieving such a place because of their intimate contacts with the parents who send their children to the performances and with the civic and business organizations.

This plan of Saturday morning matinees might be used successfully in almost any community, under the guidance of the Committee on Public Relations. The most important thing, of course, is the selection of a program which shall be entirely fitting. The Committee takes the greatest care that only such programs are shown, and its members will be glad always to cooperate with municipal officials or other good citizens who may wish to make the experiment.

A City of Dreams Coming True

An Editorial from the *Chicago Daily Tribune* of July 16, 1924

ONE of the greatest acts of municipal statesmanship in our history, or the history of any other city, was the device which is now to be adopted or rather extended for the development of the north shore. That device was the exchange of riparian rights for the right to fill in submerged lands up to a given line. The riparian rights were of little or no use or value, the made land was of great value, and the Park Board was thus able to create upon its own plans the wonderful park which is the pride and resource of the city. Rights which were in most cases merely negative and obstructive were extinguished, new property and property values were created, and the community was put in possession of a priceless possession.

The latest application of this plan is the new project for creating what will be a remarkable chain of bathing beaches from Ohio Street to Devon Avenue. The city will surrender to the Lincoln Park Board its riparian rights in front of Clarendon Beach, the pumping station, and all street ends between Diversey Avenue and Devon Avenue. In return the board will permit the city to fill in the submerged lands between the present water line and a proposed outer drive, and will provide, equip and maintain seven large bathing beaches which it is estimated will have a capacity of 200,000. And these facilities can be extended as required. The filled-in lands which the city acquires will have a value of six million dollars.

On the south side a similar development is under way and Alderman Wallace is not exaggerating when he says that when this lake-front development is completed Chicago will be the greatest summer resort in the country. There is no great city with a summer climate surpassing Chicago and no city in the world with a water-front like ours. For we have a beach the whole extent of the city. We lack the spectacular background of San Francisco or Naples, but our water-front is longer and more practicable for enjoyment. When, to the resources of a watering place on an equal scale, are added admirable hotels, theatres, concerts, the Ravinia opera, golf courses and tennis grounds, yacht harbors, boat lines for excursions, roads for motoring, and, in short, all the resources of a great city, we can fairly claim an unrivaled position.

We think the Lincoln Park Board, the Council and its special committee, and also the South Parks Board, for its projects, deserve the thanks of the city for their enterprise and foresight. They are building on magnificent lines. We would also have the people of Chicago pay tribute to the service of Daniel Hudson Burnham, the initiator of the City Plan, and of the late Bryan Lathrop and Francis Tolles Simmons, who as members of the Lincoln Park Board planned and initiated the modern Lincoln Park, especially devising the plan for exchange of riparian rights which has made riparian park development not merely cheap but actually productive of enormous new values. All these men were municipal statesmen, dreamers and practical doers, citizens of the rare breed **which makes a city great.**

The Problem of Pool-Room Regulation

By Henry Miller

Field Representative, Juvenile Protective Association, Cincinnati

DURING the last year or two the pool-room has become an increasingly serious problem. It appears to have inherited all the vices formerly associated with the now defunct saloon. All too often the pool-room is merely a blind conducted by a person of questionable character, to conceal what is in reality a gambling den, bar-room, or gathering place for the undesirables of a neighborhood. The business of conducting a pool-room is one that is licensed by the city, and in connection with which, therefore, the city assumes a certain obligation and the owner exercises a certain privilege. The young man entering a pool-room should be entitled to expect the protection involved in the fact that the premises are operated under authorization of the city authorities.

An interesting and significant aspect of the pool-room problem was revealed in the Cleveland survey of commercial recreation made in 1919. The survey studies the price of pool-room equipment. It found that the average pool-room table cost about $400, and that $700 was the average price for equipping a pool-parlor with three second-hand tables. The average profit of a three-table room, after investment, labor and up-keep were deducted, was found to be $12 a week. The survey found that equipment houses, city officials, and patrons of pool-rooms were agreed in declaring that a pool-room of less than six tables could not furnish its owner a living wage from legitimate sources. This meant that in Cleveland at that time four-fifths of the existing pool-rooms were not yielding a living wage from legitimate income.

The Juvenile Protective Association is interested in the constructive and not the destructive side of the problem. There is a movement in various parts of the country to eliminate the pool-room entirely, as an evil which defies any remedial measures. The state of Texas has already banned all pool-rooms from its domain. We recognize that the playing of billiards is in itself a wholesome and desirable form of recreation, which unfortunately has been tied up with extremely bad associations. Our aim is to separate the game from its bad associations, and make it the clean sport that it can and should be. We should like to see the billiard-hall so proper and respectable an establishment that a woman would feel free to enter its premises.

In order to ascertain how the municipal regulations pertaining to pool-rooms in Cincinnati compared with the regulations existing in other cities, a questionnaire was drafted which was sent to fifty of the largest cities in the country. The following conclusions are based on the thirty-eight replies received.

During the last few years, laws regulating pool-rooms in various cities appear to have become almost without exception more numerous and severe. In many cities, the progress in municipal administration is reflected in the effective methods of handling the pool-room problem. In three large cities, control over pool-rooms is exercised by a licensing board, which has power to issue, refuse and revoke licenses, and exercises supervision over the licensees. In the city of Detroit, pool-rooms are under the jurisdiction of the Recreation Commission. By this method of control, the pool-room is handled from the recreational point of view, and everything else is subordinated to the recreational aspect of the problem.

In fourteen cities, the minimum age at which minors are admitted to pool-rooms is twenty-one years. In nineteen of the cities, the screening of pool-rooms from street view is prohibited. Seventeen of the cities prohibit all other games from being played in a pool-room. This prohibition includes any card game, and is made in recognition of the fact that the pool-table is very often an excuse for conducting a gambling establishment. A typical city statute of this kind is that of Toledo, Ohio, which reads as follows:

> "No card games of any kind shall be permitted in any place at or in which any billiard- or pool-table . . . is kept, used or operated, or in the room in which said tables . . . are located, whether or not said room is divided by a wall or partition."

The majority of the cities provide for investigation of the character of the applicant for pool-room license. The cities of St. Paul, Scranton and Philadelphia require that the applicant for a license be vouched for by a group of citizens, and also that a public notice of the application be filed, to give persons who object to the granting of the license a chance to be heard. In addition, these cities do not allow pool-rooms in the vicinity of a school.

In nine of the large cities, provision is made for special license inspectors, whose duty it is to investigate and turn in reports concerning the pool-room licensees. The Cleveland city ordinance which authorizes the appointment of a special pool-room inspector reads as follows:

> "The Director of Finance shall appoint an Inspector of Billiard-Rooms, whose duty it shall be to obtain information pertaining to all applicants for licenses, concerning their character, the physical condition of the place in which said billiard-room is to be located, and all other information required by the Director of Finance in determining the fitness of said applicants. . . . He shall investigate all complaints, and shall at intervals inspect all billiard-rooms within the city, and make a report of such inspection to the Director of Finance. . . ."

Practically every one of the cities replying to the questionnaire has legal provision for revoking licenses of pool-room owners who have violated the law. In some, revocation is optional, and in others mandatory. A number of the cities state that revocation of license is by far the most effective way of maintaining high standards in pool-rooms. A typical regulation of this sort is the Dayton city ordinance, which reads as follows:

> "The City Manager, upon being satisfied that the statements contained in an application for a license are untrue, or that the licensee . . . has been convicted of the violation of any law of the state of Ohio, or any ordinance of the city of Dayton, relating to the regulation of or manner of conducting the business for which the license is granted, is hereby authorized to revoke the license of such licensee."

From an article on "The Pool-Room Problem in Cincinnati," in The Bulletin of The Woman's City Club of Cincinnati, for June, 1924.

Salaries Paid by Some Cities of 4,000 to 6,000 Population

(Yearly salaries are indicated for each column except the last)

	City Attorneys	Police Judges	Police Chief	Police Force	Fire Chief	Paid Firemen	Volunteer Firemen
Anaheim, Calif..........	$1,500	$900	$2,100	$1,560		$1,500	
Anoka, Minn............	800	Court costs		1,080–1,200	1,800	1,200 (driver)	$2 per fire when water is used;$1,50 if no water used
Bartow, Fla..............	500 & fees for work on bond issues	200	1,800	1,500			$1 per fire
Brigham, Utah..........	300		1,200	1,080	300		$2 per hour at fires; $1 per hour for drills
Clarinda, Iowa..........	300		1,080	1,080	100	1,200	$2 per fire
Excelsior Springs, Mo....	4,000	300	1,200			1,200	$2 per water fire; $1.50 per chemical fire
Fredericksburg, Va.......	250	500	1,200	1,140		1,140–1,200	
Glencoe, Ill..............	2,400	Fees	2,800	1,800		1,800 (drivers)	$1 per hour
Longview, Tex...........			1,800	1,200–1,500	1,800	1,080–1,200	$4 per water fire; $1.50 chemical fire
Marysville, Calif.........	600	600	2,400	1,800	900	300–1,620 and 1,800*	$25 per month each to 10 volunteers
Mt. Pleasant, Mich......	500	Fees	1,500	1,500		1,420	$200 per year
Murfreesboro, Tenn......	1,000	1,000	1,020	1,020	1,620	1,020–1,620	$1 per fire plus $1 per hour
Nowata, Okla...........	600	Fees	2,100	1,500	1,680	1,200 (Asst. Chief)	$3 per fire
Pittsburg, Calif..........	1,020	900	2,400	1,800	480	1,680 (drivers)	
Quitman, Ga............			1,800		1,200	1,080–1,200	$1 per hour
Royal Oak, Mich........	3,500	Fees	2,200	1,950		1,500	
Sanford, Fla............	900	900	2,100	1,500	2,100	1,200	
San Mateo, Calif........	1,500	900	2,100	1,680		1,800	$2.50 per fire when water used
San Rafael, Calif........	900	900	1,800	1,800	900	1,500 (drivers)	
Springfield, Vt..........	600†		1,500		300	1,300	$1 per hour
Visalia, Calif...........	1,600	600	2,400	1,800	2,100	1,500–1,800	$1,200 to volunteer company (30 men)

* Horsemen, Engineers and Captains, respectively.

† $300 each paid by Springfield Village and the Town of Springfield.

A PART OF WILMINGTON'S

A Century and a Half of Fire Department Progress in Wilmington

By Michael F. Mulrooney

Chief Clerk, Bureau of Fire, Wilmington, Del.

THE Wilmington Fire Department was organized on December 22, 1775, about six months before the Declaration of Independence, by 52 young men of the borough of Wilmington banding themselves together to assist their fellow citizens, whose property was involved in fire. They called their organization the Friendship Fire Company Number 1. Each man pledged himself to furnish one wicker basket, and two leather buckets, the former to carry goods out of a burning building, the latter to carry water with which to extinguish the fire. Soon after organizing, they procured the use of two old hand pumps that the borough authorities had purchased some time before from a French frigate, lying in the Delaware River off New Castle, Del. Leather hose, fastened together with rivets, was used in those days by the firemen.

As time went on, more companies were formed in other sections of the borough, and a man was placed in the Borough Hall tower to give the alarm in case of fire. He struck the borough bell a different number of times to denote the direction in which he saw a fire. All members were required to answer alarms of fire, and failure to do so resulted in a fine. Fines were also imposed for failure to wash off apparatus after a "run," or for taking the engines out after dark, or on Sundays, except in cases of emergency. As a man responded to a fire, he placed a lighted candle in his window to show that he had heard the alarm and had gone. A member passing one's home in which no candle was displayed had to stop and give the alarm.

Uniforms were provided and new apparatus began to appear as still more companies joined the department. The first hydraulin for furnishing the pumps with water appeared in 1819, the first hose carriage in 1832, the hand-drawn steam pumping engine in 1864. In 1868, the first chief engineer of the entire department was elected, each company heretofore having a chief for itself. In 1873, the first horses were used for fire service, in 1879 the telephone, and in 1881 the telegraph alarm system. Aerial ladder trucks appeared also in 1881, chemical and hose wagons in 1895. About this time the city was placed on a district basis, so that all companies would not respond to all alarms of fire.

In 1909, the first automobile pumping engine was placed in service, and shortly thereafter the entire department was motorized, with the exception of one company that had horses until the time they disbanded. On March 16, 1921, Governor W. D. Denney signed the bill creating the paid Fire Department for the city of Wilmington, and on December 1 of the same year the new organization began to function, with ten engine companies, three truck companies and 182 officers and men. One engine and one truck company were dropped in 1922 on account of lack of appropriations, but the truck was put back in 1923.

The Fire Department now consists of three

FIRE-FIGHTING EQUIPMENT

major divisions: the Fire Prevention Division, the School of Instruction, and the Fire Extinguishment Division. A brief account of each of these divisions will tend to show the progress that has been made in our Fire Department since the time of organization in 1775, when the sole duty of a fire department was to put out fires, up to the present date, when the duties of a fire department are to prevent as well as to extinguish fires.

The Fire Prevention Division

Our Fire Prevention Division consists of a fire marshal and two regular fire inspectors. All men disabled or unfit for active fire service are put out on inspection work. The Wilmington Fire Prevention Week campaign plan, known throughout the country for its efficiency, needs no mention here. In addition to this, we have a Clean-up Week campaign each spring. During these two campaigns, all buildings in the city are thoroughly inspected, including alleys, cellars, attics, etc., and hazards removed. During the rest of the year, the fire inspectors and the firemen assigned to inspection duty are continually making inspections of all business houses, stores, manufacturing plants, apartments, theaters, schools and large buildings, special attention being given to the buildings in the "fire belt," which embraces about 44 city blocks.

Fire-escapes are ordered erected where needed, and when hazards are found, the inspectors keep after the guilty parties until the defect is remedied. A record of all inspections is kept for future reference. In other words, we are making Wilmington as safe as possible, so far as fire is concerned. To assist us, we have had a city ordinance passed recently that takes care of such fire hazards as the manufacture, storage, and use of oil-burning equipment, explosives, pyroxilin plastics, carbide, acetylene, benzine, gasoline and kerosene, and also regulates dry-cleaning establishments, paint and varnish stores, fireworks, fire exits, fire-escapes, bonfires, rubbish, open flame, chimneys, lights in stairways, trap-doors, etc. In our campaigns and inspections we reach nearly every citizen of Wilmington, and instruct them in the necessity of fire prevention. Numerous drills, exhibitions, lectures, and publicity campaigns are conducted by the Fire Department, in the belief that one ounce of fire prevention is worth a pound of fire extinguishment.

School of Instruction

Our school of instruction is divided into four parts: the drill tower, drill yard, classroom, and smoke house. The drill tower is a brick tower, 12 x 12 x 68 feet, three sides of which are blank, the fourth side having two windows on each floor. One of the blank sides has false windows painted thereon for ladder practice. The roof is so constructed that men can work on it. The tower is equipped with a stand-pipe having inside and outside connections, and connection on each floor. One-half of the tower is a well-like aperture, used for a hose tower, while the other half has landings on each floor and ladder stairs connecting the landings. The total cost of this tower, mounted in the rear of one of our engine houses, was $3,000. It is used for scaling ladder work, inside hose work, stand-pipe work, and rescue work by both ladder and rope methods and other uses that arise at fires.

The smoke house is constructed of concrete block, 10 x 10 x 12 feet high, and was built by the men in the department at a cost of $289. Its floor and roof are of concrete, the roof being equipped with ventilator. Three sides are blank, and the fourth has one door and one window. This house is used to show the firemen the various smokes and fumes that they are likely to encounter at a fire. A fire is built in the house, and different fumes are created. Men go into the building under light smoke or fume conditions without a gas mask, and as the concentration becomes heavier, they don their gas masks. This method also teaches them the proper use and care of the gas mask.

The drill yard is where all hose, ladder work, etc., is done. In connection with the hose work, we have a small wagon, about 2 x 6 feet, mounted on iron wheels, equipped with pumper connections and turret pipe and suctions both large and small. This is used instead of a large apparatus, as it was found that the wear and tear on the apparatus was very great when used in drill work.

The classroom contains a duplicate of every tool used in the Fire Department, a blackboard for class work, and other things necessary to teach the prospective firemen how to fight fires. Large fires are drawn out, and the men are shown how the fires were fought, and how improvements, if any, could have been made.

Wm. H. Todd, shipbuilder of New York City and former member of one of the fire companies of Wilmington, has donated a large solid silver loving cup for the company making the best time in company evolutions at the drill school. The first half of the year is devoted to fire work, stretching in, raising ladders, ventilating, and other things that must be done when a company rolls to a fire. The latter part of the course consists of eighteen company evolutions which are of a competitive nature, and the company making the best time is presented with the Todd cup to hold for one year or until another company makes better time at the evolutions. This rivalry increases the efficiency of the men participating, and teaches them to "use their heads."

A SPECTACULAR TEST OF FIRE STREAMS IN WILMINGTON

Fire Extinguishment and Salvage Work

Our Fire Extinguishment Division consists of the following: 4 Ahrens-Fox triple combinations, 750 gallons capacity; one Ahrens-Fox, 1,000 gallons capacity; two American-LaFrance, 750-gallon triple combinations; one LaFrance 1,000-gallon triple combination; and one Thomas 600-gallon triple combination in active service; four steamers, 700 to 900 gallons capacity in reserve. We have nine combination hose and chemical wagons, two aerial trucks, one city service truck, two supply wagons, five officers' cars, 25,000 feet of hose (15,000 feet of which is new), and all the necessary tools and appliances required for modern fire fighting. We have 165 men and officers working on a two-platoon basis, 10 and 14 hours each shift. Each company has twelve men, two officers, two engineers and eight firemen. There are in service 120 Gamewell non-interfering fire alarm boxes, and 25 more are to be placed in service during the coming year. There are tape registers and two gongs in each house, along with the usual equipment of poles, charts, beds for each of the 165 men, baths, showers, etc. All houses are in first-class condition, with hose towers attached, separate oil rooms, gasoline tanks underground, etc., bunk rooms, recreation rooms, and cellars.

One truck, one engine and an assistant chief respond to all local alarms in residential districts; one truck and two engines and an assistant chief in the business district. One truck, two chief officers and three engines respond to box alarms in residential districts, and in the fire belt and for schools, hospitals, theaters, public institutions, etc., two trucks, two officers and four engines respond on a first alarm. We have first, second and general alarms, the city being covered by the fire operator when other companies are out. Each house is connected up to a central switchboard, located in the Municipal Building.

Our engine companies consist of one triple combination engine, one combination wagon, 2,500 feet of hose, first aid equipment, one salvage cover, one salvage hose, and the usual equipment of door openers, hydrant pumps, nozzles, pipe holders, gas masks, etc. A captain, a lieutenant, two engineers and eight firemen run the engine companies.

Supply wagons are used to carry gasoline and oil to pumpers while working at fires.

The truck companies consist of one ladder truck, equipped with scaling ladders, Browder life-saving machine, first-aid equipment and stretchers, acetylene cutting outfits, portable search-lights, battering rams, the usual truck equipment, and salvage equipment, consisting of 100 feet of 1-inch rubber hose, the same as engine companies, to be used for wetting down after a fire, or for small fires; this line being equipped with a 2½ to 1-inch reducer. Twelve salvage covers are carried on trucks to cover merchandise, furniture, etc., beneath a fire; buckets, mops, brooms, shovels, augers, etc., carried to clean up after a fire and to clear rooms of water and débris.

All men are instructed in first aid and rescue work, and must be efficient on salvage work. We have saved the citizens of Wilmington thousands of dollars by our salvage work alone, though the cost of our salvage equipment is negligible.

Organized Conservation of Vision a Social and Economic Need

Defective eyesight in the public schools is costing the taxpayers of the nation at least $130,000,000 annually, it is asserted by the Eye Sight Conservation Council of America, which, in a statement sent to directors of summer schools throughout the country, urges organized conservation of vision as a social and economic need.

The Council points out that poor eyesight is responsible for much of the retardation in schools, and makes public the results of investigations showing that a large proportion of backward children have visual defects.

Accompanying the statement is a report revealing that heavy moral and financial losses arise from this evil. Approximately 25 per cent of all school children in the United States, the Council finds, are retarded in their studies and fully one-third of this retardation is conservatively estimated as due to defective vision. If this is a correct estimate, there are at least 2,000,000 school children in the United States one or more years behind in their studies because of defective vision, says the Council's report.

Of 7,319 school children found with defective vision in the public school eye clinic of one of our large cities, 72 per cent were backward in their studies. An examination of 2,185 rural school children in a mid-western state disclosed that of those retarded nearly 60 per cent had visual defects, according to the Council.

"The correction of visual defects results in a marked improvement in school progress," the report continues. The records of 20,000 cases sent to a public school eye clinic for correction of refractive errors show that from 60 to 70 per cent of the children were classified as backward, mentally deficient, stupid or habitually left back. The careful follow-up system proved that after their defective vision had been corrected, 70 to 80 per cent of these children progressed and took their place in the class with the normal average child. The reason the remaining 20 to 30 per cent did not progress was because their retardation was due to causes other than defective vision.

"The proportion of retardation in another group, all with visual defects, was found to be 85.4 per cent. One year later, after the defective eyes had been corrected by glasses, only 17 per cent of those corrected continued to be backward in their studies.

"Furthermore, it has been found that the proportion of retardation increases with an increase in the degree of visual defect. Pupils who have less than one-half normal vision are much more retarded than those with lowered vision of a lesser degree."

A Parade That Helped Get Playgrounds

Blue Island, Ill., enthusiastically voted "Yes" when the question came up as to whether or not the city should take advantage of the state law making it possible to establish playgrounds and secure a mill tax.

The children themselves had much to do with the success of the elections, for 700 of them turned out in a parade just before the voting took place to show the citizens how badly they wanted playgrounds. VOTE FOR PLAYGROUNDS, WE WANT PLAYGROUNDS, WE NEED PLAYGROUNDS, were some of the slogans on the signs they carried.

With the children were their pets, ranging from a snail to a team of ponies. The Mayor had issued a proclamation closing the main street during the period of the parade, and motor cops, city police and Boy Scouts were on hand to see that the children and their pets were well protected. The city officials and citizens of Blue Island were delighted with the parade and plan to make it an annual event.

—*The Playground,* August, 1924.

Chamber of Commerce Activities in Public Affairs

City of 18,000 Votes $1,069,000 for Civic Improvements

LAKELAND, FLA.—The bond issue of $1,069,000 for civic improvements, voted by this city of 18,000 population on June 10, was strongly advocated by the Lakeland Chamber of Commerce. This organization sent out communications to the voters previous to the election, calling their attention to the importance of the various proposed projects, and on the day of the election each voter was called by telephone and urged to vote. The bond issue carried by a majority of more than six to one.

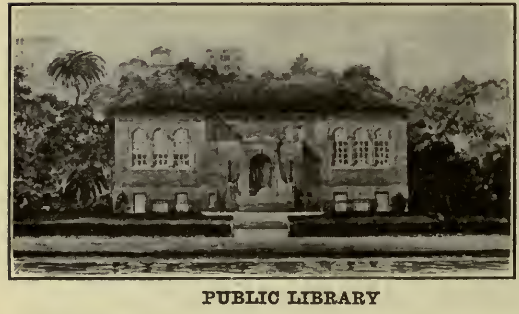
This decision of the voters will give Lakeland a group of municipal buildings which we believe will be among the finest in this state. The plans for these buildings were drawn by Franklin O. Adams, Jr., of Tampa, in a contest between a selected number of Florida architects, conducted by the city of Lakeland some time prior to the election. In announcing the contest the city stated that the drawings judged to be the most appropriate for the new public buildings would be accepted and the prize money awarded in the event that the bond issue carried. The prize-winning drawings were placed on exhibition some time ago and have been widely praised by visitors from all sections of the country.

The complete list of items included in the issue is as follows:

Site for new City Hall and municipal auditorium	$100,000
Erection of City Hall and municipal auditorium	275,000
Site and equipment of 80-acre athletic field	87,000
Erection of municipal library building	75,000
Establishment of new fire station on the north side of the city	25,000
Establishment of municipal abattoir	40,000
Erection of municipal hospital for white patients	300,000
Erection of municipal hospital for colored patients	25,000
Construction of suitable stockade and other buildings for the care of prisoners	20,000
Erection of combination jail and central fire station	40,000
Improvement and creation into parks of the shores of certain lakes within the corporate limits of Lakeland	17,000
Carrying out of needed improvements at Roselawn Cemetery	15,000
Establishment of public comfort station in Munn Park	10,000
Erection of fire station on the south side of the city	20,000
Purchase and installation of modern type of municipal incinerator	20,000

An announcement has been made by city officials that work on these various projects will be started within a short time.

T. J. APPLEYARD, JR.,
Manager, Lakeland Chamber of Commerce.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PROPOSED MVNICIPAL BVILDINGS FOR THE CITY OF LAKELAND
FRANKLIN O. ADAMS JR. ARCHITECT TAMPA FLORIDA

OBSERVATION TRAIN, WATERBURY CLEAN-UP CAMPAIGN

Observation Train Aids Clean-up Campaign

WATERBURY, CONN.—Acting upon a suggestion that a special effort be made to improve the appearance of the back yards along the railroad in this city, the Clean-up Committee of the Chamber of Commerce conducted a rather unique tour of inspection in connection with its spring clean-up campaign this year. Through the Chairman of the Committee, arrangements were made with the railroad company for a special observation train to run for several miles in either direction from Waterbury station, so as to give the members a more definite idea of actual conditions. Following a luncheon, over 100 members were taken by special trolleys and taxicabs to the station where the train waited, and the entire trip was covered in less than one hour's time. On the tour notes were made of those places where conditions were especially objectionable, and the Committee later got in touch with the various property owners and secured their cooperation in making the appearance of their premises more attractive to those entering or passing through the city by rail. The accompanying illustration shows the members assembled for the trip.

Shortly after this event a special committee was appointed by the Chamber to cooperate with the local Health Department in organizing a general clean-up week. This effort accomplished some unusually good results.

Another activity of the Chamber along the line of city beautification this year was its cooperation with the Park Department in a tree-planting campaign. Over 500 trees were planted, including Norway maples, American elms, silver maples and pin oaks, each from 10 to 12 feet high. These were supplied by the joint committee at a cost of about $1 less per tree than the usual retail prices.

ALVIN E. GILLETT,
Secretary, Waterbury Chamber of Commerce.

A Community "Wedding"

BLUEFIELD, W. VA.—When Graham, Va., just across the state line from Bluefield, W. Va., decided to change its name to Bluefield, Va., the Bluefield Chamber of Commerce initiated a big community "wedding" at which the Governors of both states were present to help celebrate the advent of Greater Bluefield. The community is now officially known as Bluefield, W. Va.-Va.

Not only was the celebration the largest ever held in southern West Virginia, and conducive to a splendid spirit of good feeling and cooperation on both sides of the state lines, but it enabled the Publicity Committee of the Chamber to "cash in" on the novelty of the event by a remarkable amount of excellent community publicity. Pictures on the order of the one herewith were published in newspapers from coast to coast. The Universal Pathé News Pictorial had a cameraman on the scene, and the moving pictures were shown in several thousand theatres. A second cameraman was present and took a reel of pictures which are now being shown throughout Virginia and West Virginia. Rotogravure sections of many large dailies were glad to use pictures.

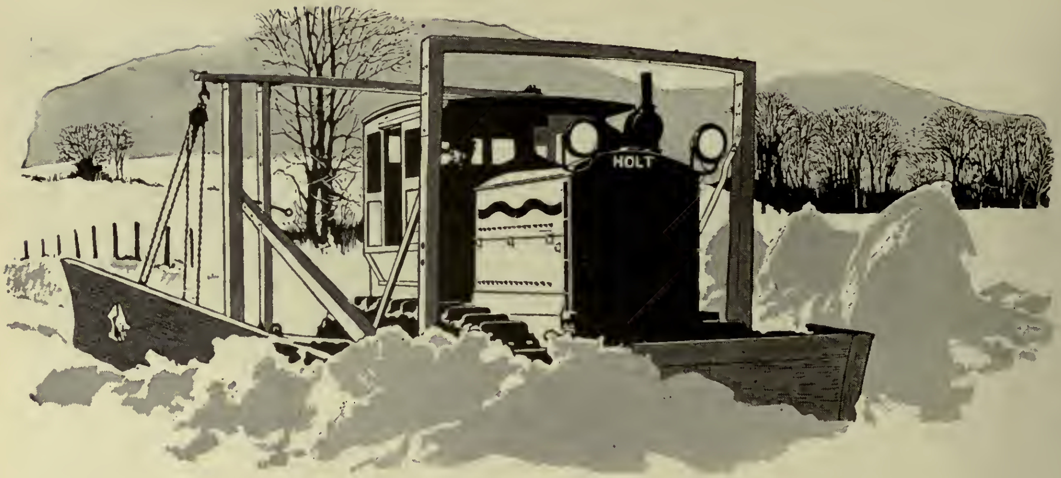
E. F. MORGAN, GOVERNOR OF W. VA., (LEFT) AND E. LEE TRINKLE, GOVERNOR OF VA., AT THE CELEBRATION

Just 38 years ago two blue-grass farms occupied the area which is now Bluefield, W. Va. The city's population is now in excess of 20,000, and Bluefield, Va., has 6,000. The city manager type of government in the West Virginia city has been outstandingly successful.

CONRAD BREVICK,
Secretary-Manager, Bluefield Chamber of Commerce.

Municipal Control of Aircraft

NEW ORLEANS, LA.—Acting upon a suggestion submitted by the Civic Bureau of the New Orleans Association of Commerce, the Commission Council of this city on May 13 last adopted the first ordinance regulating the conduct of airships while flying over the city of New Orleans. It is now



Keeping Winter Roads Open

You realize how serious the food situation, how great the fire risks, how extensive the business losses when a city is crippled by snow. Hundreds of municipalities have found the answer — "Caterpillar" Tractors for snow removal.

Is your city prepared? Right now is the time to insure the safety and health of your community against next Winter's snow blockades. New York has 50 "Caterpillars;" and congested business streets are quickly cleared by these powerful snow-fighting machines. Lincoln, Nebraska, with 5-Tons; Harrison, N. Y., with 2-Tons; Sheboygan, Wisconsin, with a 10-Ton; are typical of the many cities in the northern states which have found the "Caterpillar" the most dependable and effective power for snow removal work, as well as for road making and maintenance throughout the year.

Investigate now what "Caterpillar" Tractors have accomplished and saved for many northern cities, counties and townships. We can give you convincing facts and figures on the "Caterpillar" for snow removal and public works of every kind. Write us today.

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unlawful for any person to fly at a height of less than 1,000 feet over the densely populated sections of the city and less than 500 feet above the sparsely settled areas, in accordance with the boundaries set forth in the ordinance. These heights have been made as low as is considered wise by experienced aviators. The need for action of this kind has become especially evident within the last few months, when aviators have been known to fly as low as 200 feet above the ground while passing over the business section of the city. The act further prohibits the operation of aircraft at an angle from engine to rudder in excess of 10 degrees with the ground, or at an angle at the wing tip in excess of 45 degrees with the ground. These rulings do not apply, however, to aircraft flying over Audubon Park, City Park and the New Orleans Fair Grounds.

The throwing of papers, pamphlets or other matter from planes while in flight has also been made an offense by this ordinance. Since 1918, when a dummy was first dropped from an airplane over the business section of this city, the problem of how best to regulate the throwing or dropping of missiles and papers from the air has become increasingly serious.

LLOYD ADAMS,
Secretary, Civic Bureau, New Orleans Association of Commerce.

Chamber of Commerce Cooperates with Free Employment Office

PATERSON, N. J.—Any city will be well repaid for developing a well-run, free employment office. In those cities where there is a State or Federal Free Employment Office, the active cooperation of the city will often greatly increase the efficient functioning of the office.

I have been engaged for two and a half years by the Paterson Chamber of Commerce to cooperate in the work of the State Free Employment Office in this city. In that time the records show that this office has consistently been among the first few of the 170 cities having state employment offices.

No matter how well managed these employment offices are, they must have cooperation from the industries in their locality, including both the employers and the workers. Active representation in these offices by the city government or, perhaps better, by the chamber of commerce, will almost insure this.

A brief description of the methods used and the results accomplished by the Paterson office will give a good idea of the significance to the city of this work.

The work is divided into the two large divisions of male and female workers. A woman is in charge of the female placements, handling all classes; while the men's division is separated into two departments, "skilled" and "unskilled," in charge of two men. The "unskilled" department handles laborers, farm hands, hotel and restaurant men, and day workers, and the other department places all classes of skilled men.

When men or women having a trade or profession apply for work, they are registered on a 4 x 6-inch card. This records their name and address, telephone, occupation, age, race, birthplace, whether married or single, and number of dependents. It also includes their last three employers, the kind of work done, and the length of employment. If no suitable position is open, the card is filed under the occupation classification, and the applicant is notified as soon as an opportunity occurs.

When a request for help is received, it is recorded on another 4 x 6-inch card, giving name and address, telephone, occupation, wages, hours, probable duration of work, nationality, age limit, married or single, and place to apply. A space for "remarks" takes care of special information. If no suitable applicant is immediately available, the files of the particular class of worker wanted are referred to, and the telephone or mail is used to call them in, or the application is held until a suitable applicant comes in. The day workers and unskilled workers make the office their headquarters, and can usually be sent out at once when a call comes in.

It will be understood what a saving of time and energy is achieved where a competently operated office of this sort serves as a clearing-house for the great mass of employment in the city. The figures given here for the actual placements made in the Paterson office during the first six months of 1924, will show what a volume of work is handled:

	Skilled	Unskilled	Total
Male	2,309	2,202	4,506
Female	1,843	4,255	6,262
Total	4,152	6,457	10,768

I believe any city or chamber of commerce may count on hearty cooperation from the Federal and State Departments of Labor in furthering plans for a free employment office.

HOMER S. TRECARTIN,
Representative, Paterson Chamber of Commerce.

Boy Scouts' Civic Service Medals

AT ITS ANNUAL MEETING ON JUNE 17 LAST, THE FORT WAYNE CHAMBER OF COMMERCE PRESENTED BRONZE MEDALS TO TWENTY LOCAL BOY SCOUTS IN RECOGNITION OF THEIR PERFORMANCE OF CIVIC SERVICE DURING THE PAST YEAR. THIS AWARD, WHICH WAS FIRST MADE IN 1923, IS BASED ON SUCH SERVICES AS VOLUNTARY POLICE DUTY, FIRE PREVENTION WORK, AID IN CONVENTION PARADES, "BETTER YARDS" ACTIVITIES, ETC.

Autocars to Build Illinois Roads

Fleet of 12 Autocar Trucks Delivered to Illinois Highway Department

A fleet of twelve four-cylinder 2- to 3-ton Autocar trucks was recently delivered by the Autocar Sales & Service Company of Missouri, the St. Louis branch of The Autocar Company, Ardmore, Pa., to the Division of Highways of the Illinois State Highway Department.

These trucks are to be used in building concrete roads at Grant Park, Ill., about fifty miles south of Chicago. Previously the State Highway Department had used a fleet of nine Autocar trucks in the construction of a road from Carbondale to Bosky Dell, Ill. The trucks have pneumatic tires and rotary dump steel bodies, with partition gates that permit the hauling by each truck of two batches of concrete mixture.

Autocar motor trucks, because of their short wheelbase handiness and their tremendous power and stamina, are regarded by contractors and city officials as the standard equipment for modern municipal highway construction work.

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The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

Changing the Use of Public Property

FREQUENTLY, the courts are called upon to determine the right of municipalities to alter the use of property previously dedicated to a special object.

It seems that the narrowest limitation of municipal power in this regard applies to gifts by individuals to cities for specific purposes.

Where land was dedicated for use as a "plaza," the dedicator intending that the land should be used as a public square, a town had no right to construct on the tract a town hall containing a jail, according to the holding of the California Supreme Court in the case of Kelly v. Town of Hayward, 219 Pacific Reporter, 749. The court said, in passing:

> "It might be suggested at this point that it would seem that the intention of the dedicator and the terms of the dedication as interpreted by the predecessors of the present town authorities, by leaving this land unoccupied by any edifice for a period of 45 years, would be an almost conclusive argument upon the question of such intention; also, that if the present board of trustees has discretion to utilize a portion of this block for town buildings, some future board might claim that under their discretion a corporation yard and rock pile for the employment of prisoners, and other very useful adjuncts to the administration of the economic affairs of the town, might be located thereupon, until the entire space was fully so occupied."

But that adherence strictly to the dedicated purpose will not be enforced where adherence would be unreasonable, is well illustrated by a decision of the Massachusetts Supreme Judicial Court (89 Northeastern Reporter, 177), dealing with Boston Common. It was held that there was no invalid diversion of the use of the Common in constructing a subway under it and in providing approaches to a subway station; there being no material interference with the surface. The court said:

> "What are the uses to which the property may be put? Only two are specifically mentioned, one for a training field and the other for a cow pasture. The inhabitants are to use it in common. . . . This dedication was very soon after the arrival of the first colonists in this part of New England. . . . The words chosen to designate the use indicate an intention that the place should be kept for occupation by the public as a common, in ways of which the two specified are only typical. As years have gone by, there is no longer any occasion for common occupation of this land as a cow pasture, and in the sense in which the words 'training field' were then used, this is almost true of this kind of use. The proper execution of the public trust requires that the property be still kept open as a common for occupation by all the people, in ways that are kindred to those in which a common would ordinarily be used under such a dedication in the early years of the colony. In general, it seems to have been the purpose and the endeavor of the public authorities, for almost three centuries, to preserve the common for uses, as nearly as possible under changing conditions, like those indicated by the original dedication. Not only have grass and trees been cultivated and spaces set apart for games and for the evolutions of soldiers, but walks have been laid out, monuments erected, fountains set up, and other provisions made for the comfort and pleasure of the public in their use of the place.
>
> "As against the donors and the interest which they undertook to serve, it is plain that, except in the exercise of the right of eminent domain, the common could not be appropriated to a public use entirely inconsistent with the general character of the use originally intended. Whether it could be taken in this right [under the power of eminent domain] it is unnecessary in this case to decide, as the statute does not purport to take property in the common under the right of eminent domain. . . . It is possible that there has been such an acceptance of the dedication of the original donors by the town and city of Boston and by the legislature under different statutes, and such a creation of a public trust in this particular, as to deprive the public authorities of the right, that they otherwise would have, to devote the property to a public use of an entirely different kind."

The right of defendant city to change the location of a statue representing an Indian group, from one site to another in Lincoln Park, Newark, was recognized by the New Jersey Court of Chancery, in the case of Coles vs. City of Newark, 121 Atlantic Reporter, 782.

The statue was given in 1895 by Coles to the city. He selected the site, but there was no condition against removal. When the city proceeded toward replacing the statue on a slightly less prominent site in the same park, a short distance from the original site, Coles sued to restrain execution of the plan. Denying the injunction sought, the court said:

> "The claim of the complainant that the mutual selection of the site by him and the city before the completion of the gift implied a condition of

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MILWAUKEE, WIS. say their street department is well pleased with Baker Snow Plows.

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Baker Tractor Snow Plow operating on City street.

It is time to select your snow moving equipment for the coming winter. Be sure you choose snow plows that have weathered the storm and have been proved dependable. Baker Snow Plows have performed the bulk of the snow moving in the snow regions in the past. They were chosen because they did a thorough job and stood up under the load. That is why they were selected to do the snow moving for the leading State Highway Departments, Counties and Cities as well as small cities and villages.

Baker Snow Plows are built for both motor trucks and tractors. The Baker Auto Truck Snow Plow with the well known Patent Tripping Blades is still the leading truck plow. Then there are the Baker Tractor Snow Plows built for tractors from the heaviest to the lightest—all made especially for the power used. All dependable Baker Snow Plows.

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irremovability is not apparent. The gift had no strings to it; it was outright, for public purposes—the ornamentation and embellishment of the city, and possibly, but remotely, for charity. The city became trustee for the public, forever and always, so long as the monument endures and serves the public interest. I quite agree with the contention of the city that the gift worked a change of title and that the donor lost all property rights therein, but I cannot give assent to its assertion that 'if that is so, it is within the power of the city to do what it will with the monument, even so far as to dispose of it by sale or demolish it, if in the judgment of the present officials of the city of Newark such disposition of it is advisable.' Not so long as the monument serves the public use. To sell or demolish it, arbitrarily, would be an abuse of the trust the city owes the public, and would be enjoined upon the application of the cestui que trust—the public; or the donor could intervene.. . . . Only when it ceases to serve the public will the trust end.

"As long as the city acts in good faith in the execution of its trust, i. e., uses the monument in a reasonable manner to beautify the city, equity cannot interfere with its discretion. If it is kept in mind that the real trust of the city is the adornment of the town, and that the monument is only an instrument to that end, the case is simple. When the monument was erected, the city trustee selected the present site as the one then most suitable for carrying out the trust. The donor approved. Now if, to enhance the beauty of Lincoln Park, the city sees fit to remove the 'Indian Group' to another point in the park, not remote or obscure, but, as I understand, in close proximity to other monuments of as great or even greater artistic value, to make room for an imposing and inspiring war hero monument, and which, for obvious reasons, has the call of the day, I fail to see how, reasonably, it can be said that the city is not discharging its trust in letter and spirit; or, to put it more closely, how can it be said that it is abusing its trust? That the city at one time thought that the present site of the 'Indian Group' was then the appropriate place for the fulfillment of the trust is not an obstacle to the selection of another, and the donor's acquiescence in the earlier location does not imply a privilege to obstruct the choice of a new one. Suppose the site had since been surrounded by factories, would it not have been within the discretion—yes, would it not have been the duty—of the city to choose another and a fit place for the monument? And could the donor object?"

It has been decided that the following uses constituted illegal diversions: Construction of a railroad across a public square (67 Illinois Supreme Court Reports, 540). (But in a Philadelphia case [175 Pennsylvania Supreme Court Reports, 28] it was held that a passenger railway might be extended within a park to enable persons of moderate means to visit the place.) Establishment of a public highway through a park where it does not constitute a pleasure driveway (210 Illinois Supreme Court Reports, 308). Maintenance of a pumping station on land dedicated as a "common, park, or boulevard, and for no other purpose" (171 Massachusetts Supreme Judicial Court Reports, 575).

But it has been decided that erection of a building for a public library, with rooms for the library directors, did not violate a dedication of land for park purposes (150 California Supreme Court Reports, 64).

Sundry Items of Municipal Law

City Held to Have Power to Use Public Money and Vote Bonds for Municipal Auditorium and Community Center Building

The power of the city of St. Louis to use public money and vote bonds for a proposed municipal auditorium and community center building was upheld by the Missouri Supreme Court in the case of Halbruegger vs. City of St. Louis, 262 Southwestern Reporter, 379. The court said:

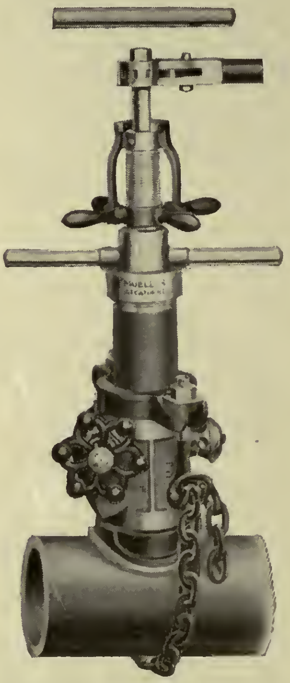
"In many matters of local, and even more general concern, the need of the citizens of a municipality for a convenient and adequate place of assemblage is too obvious to require particularization. The arts and sciences require places for display of their works. The cause of education can be served in many ways by such a structure. When all these things are considered, we find no difficulty in holding that, under the generally approved rule . . . the court cannot say the purpose, evidenced by the proposal in question, is not a public one. . . .

"It is urged that there is an intent to use the proposed structure, in some instances, for purposes not strictly public, in the proper sense. A secret intent of certain individuals, if such an intent exists, cannot be invoked to render illegal a purpose which in itself is legal. It is not to be assumed that a building adapted for public purposes will be used for others which are of such a character as to be unlawful. . . . In case any illegal use of the building is attempted, the courts will be open for proper proceedings to prevent it."

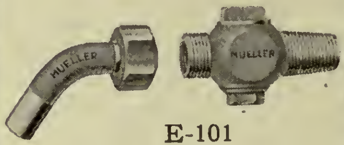
Anti-Peddler Ordinance Held to Be Unconstitutional

An ordinance of defendant city purported to forbid peddlers and solicitors to call at dwelling-houses bearing the sign "No Peddlers." The ordinance was declared by the United States District Court for the Northern District of California to be unconstitutional, in the recent case of Real Silk Hosiery Mills vs. City of Richmond, Calif., 298 Federal Reporter, 126. The ordinance was held to be specially objectionable as applied to solicitors for orders to be filled in interstate commerce. The court said:

"The ordinance aims at prevention of trespass. annoyance, conflict, disorder, and breach of the peace, otherwise of reasonable apprehension. In principle it is legitimate exercise of local self-government or police power, in no wise encroaching upon interstate commerce; for the latter does



"B" Tapping Machine



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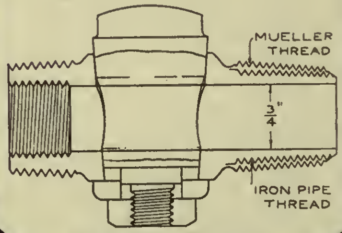

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is used by practically every Water Works in the United States, because it lowers tapping costs and will safely tap and insert a corporation stop from ½" to 1"—and will ***tap only*** up to 2".

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not license the offensive conduct by the ordinance denounced nor confer immunity against consequent punishment.

"But though the ordinance, even as the householder's sign, recognizes the legal and popular distinction between peddlers and solicitors or agents, it undertakes to extend its ban beyond the householder's. It would visit the consequence of trespass upon solicitors guiltless of any offending. A householder's ban upon peddlers is none to solicitors, and so the latter may there lawfully enter and solicit contracts, though the former are excluded from trade. Where the householder permits solicitors, the city cannot forbid.

"Hence application of the ordinance to plaintiff's solicitors is unwarranted interference with interstate commerce, and deprivation of liberty of contract and of property without due process of law."

Municipal Power to Supply Lighting Facilities

Authority to a municipality to provide for lighting its streets and supplying light to its inhabitants implies, in the absence of special restriction, power to make proper contract with an individual or corporation therefor, held the Florida Supreme Court in the case of State vs. Pinellas County Power Company, 100 Southern Reporter, 504. In the same case it is held that power "to provide for the lighting of streets of the city," and to do such other "acts as shall seem necessary and best adapted to the improvement and general interest of the city," and to raise by tax and assessment upon all real and personal property all sums of money needed for the improvement and good government of the city, etc., is sufficient to authorize the municipality to erect and maintain an adequate plant for supplying electric lights and power to the city and its inhabitants, or to make a proper contract with an individual or corporation to do so.

Statute Requiring Operators of a Certain Class of Motor Vehicles to Furnish Bonds—Upheld

The right of a state to single out a class of motor vehicles operated for hire and to require their operators to give bond or carry insurance to idemnify against liability for injuries caused in the operation of such vehicles was sustained by the highest court of the land in the recent case of Packard vs. Banton, 44 Supreme Court Reporter, 257. Overruling a contention that such a law in force in New York cities of the first class was unconstitutional as being unjustly discriminatory, the Court said:

"If the state determines that the use of streets for private purposes in the usual and ordinary manner shall be preferred over their use by common carriers for hire, there is nothing in the Fourteenth Amendment to prevent. The streets belong to the public and are primarily for the use of the public in the ordinary way. Their use for the purpose of gain is special and extraordinary, and generally, at least, may be prohibited or conditioned as the Legislature deems proper. Neither is there substance in the complaint that street cars and omnibuses are not included in the requirements of the statute. The reason, appearing in the statute itself, for excluding them, is that they are regulated by the Public Service Commission Laws, and this circumstance, if there were nothing more, would preclude us from saying that their non-inclusion renders the classification so arbitrary as to cause it to be obnoxious to the equal protection clause."

Obstructions for Private Purposes Upon Public Sidewalks and Streets Cannot Be Licensed by City

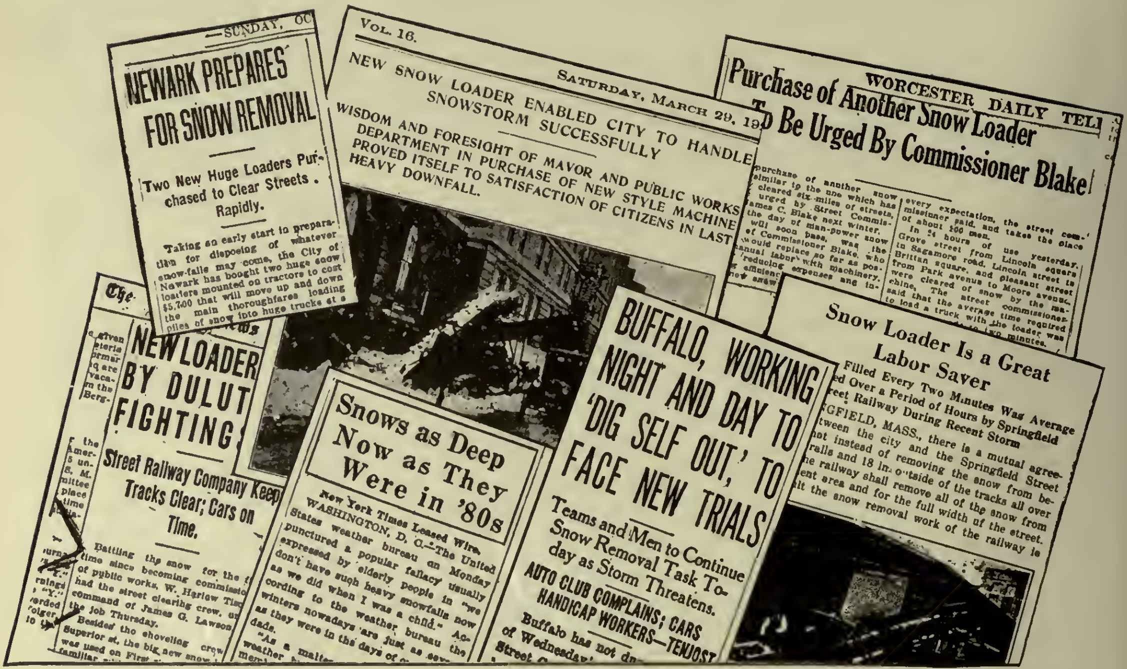
That cities are powerless to license the obstruction of public sidewalks and streets for private business purposes is a proposition of law reaffirmed lately by the Appellate Division of the New York Supreme Court in the case of Kahabka vs. Schwab, 199 New York Supplement, 551. Although the particular obstructions dealt with in this case were gasoline pumps located near curbs, the opinion shows that the legal principle involved extends to all kindred obstructions, including news-stands. The Court quotes from an earlier decision on the subject, in which the New York Court of Appeals upheld the conclusions reached:

"It is elementary law that the public is entitled to the free and unobstructed use of city streets, and that any obstruction of such streets for private use interferes with the public right, constitutes a nuisance, and may be removed at the suit of any interested citizen. There are certain exceptions to this general statement, as where there are temporary obstructions, or obstructions which the courts have considered as not amounting to a substantial interference with traffic, and as permissible and not in conflict with the purposes for which streets and highways are maintained. . . . The primary purpose of streets is for the use of the public for travel and transportation, and any private obstruction or encroachment which interferes with such use is a nuisance. Under these general rules, it has been held repeatedly that storekeepers cannot use any part of the sidewalk for their show-cases, show-windows, and other like purposes, as the right of the public is absolute and paramount, and the public has the right to the use of the entire street."

Court Enjoins Amusement Park as Nuisance in Residential District

Owners of property in a residential district were held by the Pennsylvania Supreme Court to be entitled to enjoin establishment of an amusement park in the district, in the recent case of Edmunds vs. Duff, 124 Atlantic Reporter, 489. In the course of the opinion, it was said:

"No man has a right to take from another the enjoyment of the reasonable and essential comforts of life and, consequently, cannot commit acts on his own premises calculated to interfere with the reasonable enjoyment by others of their homes. Even music, however elevating and enjoyable at times, and depending, of course, on its character, may be continued so long as to become an annoyance to those compelled to remain in the immediate vicinity. In fact, the general trend of decision has been to hold that any noise, whether of musical instruments or the human voice, or by mechanical means, or however produced, may be a nuisance, especially if its tendency is to draw together in the vicinity of a person's residence or place of business large crowds of noisy and disorderly people."



—SUNDAY, OC

NEWARK PREPARES FOR SNOW REMOVAL

Two New Huge Loaders Purchased to Clear Streets Rapidly.

Taking an early start in preparation for disposing of whatever snow-falls may come, the City of Newark has bought two huge snow loaders mounted on tractors to cost $5,700 that will move up and down the main thoroughfares loading piles of snow into huge trucks at a

VOL. 16. SATURDAY, MARCH 29, 19

NEW SNOW LOADER ENABLED CITY TO HANDLE SNOWSTORM SUCCESSFULLY

WISDOM AND FORESIGHT OF MAYOR AND PUBLIC WORKS DEPARTMENT IN PURCHASE OF NEW STYLE MACHINE PROVED ITSELF TO SATISFACTION OF CITIZENS IN LAST HEAVY DOWNFALL.

WORCESTER DAILY TELE

Purchase of Another Snow Loader To Be Urged By Commissioner Blake

purchase of another snow similar to the one which has cleared six miles of streets, urged by Street Commissioner James C. Blake next winter. the day of man-power snow will soon pass, was the of Commissioner Blake, who would replace so far as possible manual labor with machinery, reducing expenses and in- every expectation, the street commissioner said, and takes the place of about 100 men.

In 24 hours of use yesterday, Grove street from Lincoln square to Sagamore road, Lincoln street to Brittan square, and Pleasant street from Park avenue to Moore avenue, were cleared of snow by the machine. The street commissioner said that the average time required to load a truck with the loader was two minutes.

The

NEW LOADER BY DULUT FIGHTING

Street Railway Company Keep Tracks Clear; Cars on Time.

Battling the snow for the time since becoming commissioner of public works, W. Harlow Tis had the street clearing crew, under command of James G. Lawson, the job Thursday.

Besides the shoveling crew Superior st, the big new snow was used on First

Snows as Deep Now as They Were in '80s

New York Times Leased Wire.

WASHINGTON, D. C.—The United States weather bureau on Monday punctured a popular fallacy usually expressed by elderly people in "we don't have such heavy snowfalls now as we did when I was a child." According to the weather bureau the winters nowadays are just as severe as they were in the days of decade.

"As a matter weather

BUFFALO, WORKING NIGHT AND DAY TO 'DIG SELF OUT,' TO FACE NEW TRIALS

Teams and Men to Continue Snow Removal Task Today as Storm Threatens.

AUTO CLUB COMPLAINS; CARS HANDICAP WORKERS—TENJOST

Buffalo has not of Wednesday Street

Snow Loader Is a Great Labor Saver

Filled Every Two Minutes Was Average Over a Period of Hours by Springfield Street Railway During Recent Storm

SPRINGFIELD, MASS., there is a mutual agreement between the city and the Springfield Street Railway that instead of removing the snow from between the rails and 18 in. outside of the tracks all over the railway shall remove all of the snow from the entire area and for the full width of the street. The snow removal work of the railway is

Fight snow as you fight fire

Whenever a city allows a heavy snowfall to lie on its streets, that city pays heavily in business losses. And every hour multiplies these losses. In one New York snow storm alone, it is estimated that the merchants suffered a trade loss of sixty million dollars.

And more important than this, the fire menace is greatly increased.

Fire-fighting apparatus is stalled, or delayed long enough to allow small blazes to grow into big, dangerous and costly fires.

Our largest cities, and a great many smaller ones, are now fighting snow as they fight fire—as one of a city's greatest menaces. They are clearing their streets with the Barber-Greene Snow Loader—which has proved beyond question to be the swiftest, most efficient and economical method of snow removal known.

No other method has ever approached the record made in Albany, where a Barber-Greene loaded more than 2,000 cubic yards of snow into trucks in 10 hours. In Milwaukee a side-discharge Barber-Greene loaded a 3-trailer train with 21 cubic yards of snow in 3 minutes. In Boston a Barber-Greene operated for 112 consecutive hours, and could have continued indefinitely. Hand labor—could it have endured such grilling and protracted work—could have attained only a fraction of the Barber-Greene speed.

The Barber-Greene that saves its cost in a single snow storm, will pay for itself again in one summer's road work. When the snow boom is replaced with a bucket loader boom, the machine is ready to handle stone, sand, or any other bulk material.

Our new booklet, "Snow Insurance," pictures and describes how many of our cities are successfully combatting the winter's worst menace. Send for it now, for now is the time to plan your coming snow battle.

BARBER-GREENE COMPANY—*Representatives in Fifty Cities*—515 W. Park Avenue, Aurora, Illinois

BARBER B G GREENE

Portable Belt Conveyors Self Feeding Bucket Loaders

Coal Loaders . Automatic Ditch Diggers Snow Loaders . . . . Coal Feeders

Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources

For further information, Mr. Williams may be addressed in care of
THE AMERICAN CITY MAGAZINE, 443 Fourth Avenue, New York

Recent Zoning Ordinances

SAN BUENAVENTURA, CALIF.—Ordinance, June 9, 1924
WILMINGTON, DEL.—Ordinance, July 29, 1924
NEW BRUNSWICK, N. J.—Ordinance, August 19, 1924
BUFFALO, N. Y.—Amendment of Ordinance, July 23, 1924 (use, height and area)
ITHACA, N. Y.—Ordinance, May 22, 1923

The San Buenaventura ordinance defines a "single family dwelling" as follows: "A detached house designed for the use of a single household, including two or more people living as a family and wherein not more than five people are sheltered for hire."

The Wilmington Zoning Ordinance seems to be the first ordinance of this sort passed in the State of Delaware. The "Proposed Ordinance" printed in February, 1924, contains valuable notes and diagrams.

The New Brunswick ordinance seems to be the first zoning ordinance passed in New Jersey since the enactment of the new zoning law (1924, ch. 146) already noted and commented on in these columns, both in connection with the well-known Nutley case, and otherwise.

Recent Zoning Decisions

NEW JERSEY.—In the six New Jersey Supreme Court cases noted below, all applications for mandamus, the well-known Nutley case (Ignaciunas v. Risley, 1 N. J. Adv. R. 1023) is cited by the applicant as conclusive in his favor. In the first of these cases, that case is distinguished; in the others it is followed.

Hench v. City of East Orange, 2 N. J. Adv. R. No. 26, p. 510 (June 28, 1924). Mandamus to compel the building inspector to issue a permit for the erection of two garages, contrary to the zoning ordinance of the city, refused. It was contended that, under the New Jersey decisions the ordinance was invalid. But the validity of the entire ordinance is not involved. The statute under which the zoning ordinance was passed authorizes municipalities to pass ordinances reasonably required for the protection of the public health and safety and the general welfare; and the presumption is that the purpose of the municipality in passing the portion of the ordinance in question was that indicated in the statute.

Huppert and Teitelbaum v. Hague et al, Board of Commissioners of the City of Jersey City, 2 N. J. Adv. R. No. 20, p. 348 (May 17, 1924). Conversion of garages into stores and erection of stores.

King v. Favier, Building Inspector of Township of Lyndhurst, 2 N. J. Adv. R. No. 21, p. 358 (May 24, 1924). Alteration of building to make it suitable for a store.

Plymouth Co. v. Bigelow, Superintendent of Buildings, Newark, N. J., reported in The Sun, July 22, 1924, p. 1. Erection of four-story apartment and store building.

R. and B. Realty and Construction Co., Inc., v. Jelleme, Building Inspector of City of Passaic, 2 N. J. Adv. R. No. 21, p. 356 (May 24, 1924). Erection of three two-family houses.

White v. Bower, Building Inspector of Borough of Ridgefield, and the Borough of Ridgefield, 2 N. J. Adv. R. No. 21, p. 357 (May 24, 1924). Erection of office building.

In these five cases mandamus to compel the issuance of a permit for the erection of the structure in the district contrary to the provisions of the zoning ordinance, was granted, on the authority of the Nutley case.

NEW YORK. *City of New York v. Holzman*, reported in New York Law Journal, August 7, 1924, p. 1523 (Supreme Court, Special Term). Suit to enjoin the removal of sand from lands owned by defendants, and situated in a residential district. The defendants are not erecting any building on the lands, nor are they using them for business purposes, except in so far as is involved in the removal of the sand. *Held* that it does not come within the uses prohibited in a residence district by the New York City zoning resolution. That the use is but temporary is conceded by the city and is shown by the fact that as fast as excavations are made and the sand carted away the openings in the ground are filled up with earth hauled in the same carts as are used to remove the sand. Assuming, however, that it was the intention of the zoning resolution to prevent such use of vacant premises, such resolution is in the opinion of the court invalid. Sand is valuable property, and the owner of land upon which there is sand or other valuable property cannot constitutionally be prevented from severing and selling it. No authorities on the question were cited by either party or discovered by the court. Motion for injunction denied.

People ex rel. Smith v. Walsh, reported in New York Law Journal, July 12, 1924, p. 1335. Certiorari from a decision of the Board of Standards and Appeals permitting the erection of a garage for more than five cars in a residence district created by the New Yok City zoning resolution. *Held* that the board could have taken this action under its authority to vary the provisions of the resolution to avoid practical difficulties or unnecessary hardships; in which case this court would have been limited to the inquiry whether it had jurisdiction. Instead, it granted the application on the ground that the community interest would best be served and the integrity of the zoning resolution be best maintained by permitting the garage. The case is therefore before this court on its merits, and is referred to a referee for the taking of further testimony.

OHIO. *Kahn Bros. Co. v. City of Youngstown*,

Bellflower Avenue, Cleveland, Ohio. Tarvia-built 1905.

Both were new in 1905—
Today the Tarvia Street is Still Good

CLEVELAND, 1905! Bellflower Avenue paved with Tarvia! Traffic in those days was almost entirely "horse-and-carriage." Occasionally a motor car passed — a puffing, high-seated affair.

Time brings its changes. The old-time cars are junk. But the Tarvia pavement on Bellflower Avenue, after nearly 20 years of constant traffic, is as good as the day it was laid.

Nor is this exceptional. At remarkably small cost, Tarvia streets can be kept good for many years. And in addition: Tarvia pavements will not wave, roll or rut. Tarvia pavements are skid-proof because of their granular surface.

Thousands of Tarvia streets and roads have proved that—for the money spent—Tarvia gives more mileage and the most years of satisfactory pavement service.

On request, we will gladly send you descriptive booklet, construction data and specifications.

Tarvia
For Road Construction Repair and Maintenance

The Barrett Company

New York Chicago Philadelphia Boston
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Youngstown Milwaukee Toledo Columbus
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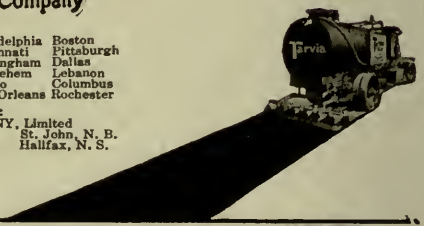

Common Pleas Court of Mahoning County, reported in 25 Ohio Nisi Prius Reports. New Series, p. 31; also in 22 Ohio Law Bulletin, June 16, 1924, No. 13. The provision of the Youngstown Zoning Ordinance forbidding the erection of an apartment house in a given district is valid, and the ordinance constitutional. The enforcement of the ordinance will not be enjoined on the ground that the restriction is for the benefit of adjacent property owners and for purely aesthetic purposes. On the contrary, the erection of such a house in the locality in question would be contrary to the public health, safety, convenience and general welfare. The decision discusses the entire subject exhaustively and cites numerous authorities.

Santangelo v. City of Cincinnati, Superior Court of Cincinnati, June 18, 1924. The official syllabus of this case, briefly referred to in the August "Notes," is as follows:

1. A building permit does not constitute a contract or create any vested interest.
2. The Building Commissioner of the City of Cincinnati has jurisdiction and discretion to revoke a building permit granted by him when the application contains material misrepresentation or the work authorized thereunder is proceeding in violation of law, including the Occupational Tax Law.
3. Where a building permit is granted prior to the effective date of the Zoning Law and is revoked by Building Commissioner after said law goes into effect, subsequent permission to proceed is subject to the provisions of such Zoning Law when substantial construction has not already commenced.
4. The Cincinnati Zoning Law (Ordinance No. 71-1924, of Cincinnati, Ohio) is a valid and constitutional ordinance.
5. The provisions of the Cincinnati Zoning Ordinance are independent and the provisions thereof restricting residential property from invasion by business enterprises is a reasonable regulation well within the police power of the municipality.

The court in its opinion considers the entire question of the constitutionality of zoning at length and from many points of view.

Recent Zoning Literature

The *National Municipal Review* for September, 1924, will contain a paper by Edward M. Bassett, Esq., Counsel of Zoning Committee of New York and Director of Legal Division of Regional Plan of New York and Its Environs, entitled "Constitutionality of Zoning in the Light of Recent Court Decisions." The same author has contributed to the *Brooklyn Eagle* of July 13, 1924, a more popular article on "How Zoning Halted Exodus of Residents from New York City."

In the *American Bar Association Journal* of March, 1924, p. 185, will be found a contribution from J. P. Chamberlain and Sterling Pierson upon "Zoning Laws and Ordinances."

A "Statement and Evidence Submitted on Pending Zoning Ordinance, to City Council of Cincinnati on the 24th day of January, 1924," has been issued by the United City Planning Committee of Cincinnati. In this sixty-page pamphlet will be found the statements of experts and the reports of leading authorities with regard to zoning from the point of view of health, recreation, housing, social welfare, real estate values, engineering, constitutionality, experience in other cities, etc. The pamphlet is an important contribution to the literature of the subject.

The Municipal Bond Market

By Sanders Shanks, Jr.

Editor, *The Bond Buyer*

THE ever advancing and seemingly impregnable strength of the municipal bond market has withstood surprisingly the heat of the summer and the absence of many investors and bond men. The summer is usually the dullest season of the year, but this year the market continues to advance with the year.

During the early part of August, it seemed as though there was going to be a scarcity of new issues, and consequently when Baltimore, Md., offered $8,510,000 4s and 5s, a group of New York and Baltimore bankers, headed by Kountze Brothers, purchased the issue at an approximate yield of 4.08 per cent.

Later in the month the City of Utica, N. Y., offered for sale various issues of 4 per cent bonds which were taken by a syndicate, which paid 3.99 per cent.

The greatest demand at present is for short-term investments, owing to depressed business conditions and the resultant abundance of idle funds. The State of Massachusetts has just borrowed $2,000,000 at 2 per cent for three months.

Another interesting bond sale was that of the State of Illinois, which sold $9,000,000 Highway 4s and $3,000,000 Soldiers' Compensation 4¼s at a net interest cost to the state of 4.08 per cent and 4.11 per cent respectively. In June of this year, when it was considered that the market was exceptionally good ($280,000,000 bonds were underwritten at that time), Illinois sold a similar issue of Highway bonds at 4.29 per cent, a difference of 1/5 of 1 per cent interest cost.

Every attractive bond issue that has been floated this month has been sought by a great list of eager bidders, each having figured his profit on the smallest margin justifiable to handle the issue. The result was, in one particular case, that the purchaser of the bonds only covered his nearest competitor by one cent on a thousand dollar bond.

Municipalities which have had the good fortune or good judgment to have profited by this market have saved from one-quarter to one-half per cent in interest over borrowing done a year ago.

The following tabulation shows a few of the most important issues floated during the month:

Amount	Borrower	Maturity	Coupon Rate (%)	Net Yield (%)
$703,000	State of Maryland...	1927-39	4½	4.05
8,510,000	Baltimore, Md.......	1925-42	5 & 4	4.08
1,624,000	Trenton, N. J.......	1926-60	4¼	4.12
411,297	Utica, N. Y.........	1925-44	4	3.99
776,750	Minneapolis, Minn....	1925-44	4¼	4.18
3,330,000	Cincinnati, Ohio.....	1925-43	4½	4.22
4,000,000	Denver, Colo.........	1943-62	4½	4.31
2,000,000	Los Angeles.........	1925-64	4½	4.45
1,750,000	Charlotte, N. C......	1926-65	4½	4.45
1,035,000	Greensboro, N. C.....	1926-45	4¾	4.57
500,000	Tampa, Fla..........	1929-48	5	4.73
950,000	Miami, Fla..........	1935-54	4¾	4.84
4,350,000	San Antonio, Tex....	1925-64	5	4.90

Photograph shown above taken in 1904

Pounded 21 Years by Traffic

and still in splendid condition

Laid in 1903—twenty-one years ago—the Trinidad Lake Asphalt paving on Cadillac Square, Detroit, is still carrying heavy traffic with but little signs of wear.

What other bituminous paving material could equal this record? Yet it is just one of hundreds proving the remarkable durability and economy of Trinidad—a native-lake asphalt.

Trinidad Lake Asphalt pavements not only hold world's records for long-life, but for low cost per year of service. They are attractive, resilient and noiseless.

We have some interesting data regarding this nature-made paving material. Write for it at once.

THE BARBER ASPHALT COMPANY
PHILADELPHIA
New York St. Louis Chicago Pittsburgh San Francisco Kansas City

TRINIDAD LAKE ASPHALT

Hints, Helps and Happenings

City Managership as an Established Profession

NOTWITHSTANDING the fact that city managership is one of the youngest of the professions in America, the following table, compiled by THE AMERICAN CITY with the co-operation of the City Managers' Association, indicates that it is already offering a real career for men of ability who desire to devote their lives to municipal administration. The table lists only the men—59 of them—who have already had service of five years or more in this new profession:

A complete list of city manager cities, corrected to March, 1924, with a record of the number of cities which have adopted the plan each year, will be found on page 14 of the 1924 *Municipal Index*.

Name	Now City Manager of	No. Cities Served	Date of First Appointment as a City Manager
C. Arrasmith	Fillmore, Calif	1	October, 1918
C. R. Ashburner	Stockton, Calif	4	September, 1908
W. E. Baumgartner	Alpena, Mich	2	May, 1918
Philip H. Beauvais	Royal Oak, Mich	2	May, 1918
Edw. A. Beck	Lynchburg, Va	5	March, 1914
C. A. Bingham	Lima, Ohio	4	April, 1915
E. P. Bridges	Griffin, Ga	1	December, 1918
R. H. Brinkley	Suffolk, Va	1	August, 1919
O. E. Carr	Dubuque, Ia	4	March, 1914
F. G. Connelly	Estherville, Ia	1	May, 1919
Abram Cook	Waycross, Ga	2	January, 1917
W. M. Cotton	Ashtabula, Ohio	4	October, 1917
J. J. Curle	Cynthiana, Ky	1	January, 1918
Oscar Dobbs	Palatka, Fla	3	June, 1919
J. H. Duchastel	Outremont, Que	1	July, 1918
O. J. S. Ellingson	Sherman, Tex	1	April, 1916
I. R. Ellison	Muskegon, Mich	3	April, 1916
H. J. Graeser	Temple, Tex	2	August, 1918
J. O. Gregg	Iowa Falls, Ia	1	March, 1917
W. P. Hammersley	Norwood, Mass	1	March, 1918
H. V Hennen	Denton, Tex	1	May, 1919
L. J. Houston, Jr	Fredericksburg, Va	1	October, 1918
Wm. T. Howie	Towanda, Pa	1	April, 1918
V. J. Hultquist	Alcoa, Tenn	1	July, 1919
W. P. Hunter	Roanoke, Va	1	September, 1918
A. V. Hyde	Taylor, Tex	1	April, 1918
F. L. Jenkins	Portland, Mich	1	January, 1919
O. O. Johnson	Sturgis, Mich	2	May, 1918
George Johnston	Cadillac, Mich	1	April, 1918
S. S. King	Rome, Ga	1	April, 1919
W. D. Kochersperger	Mifflinburg, Pa	1	January, 1919
Fred H. Locke	Grand Rapids, Mich	1	May, 1918
G. J. Long	Webster City, Ia	1	April, 1917
T. W. McMillan	Mt. Pleasant, Iowa	1	April, 1916
Eugene Masters	St. Augustine, Fla	1	April, 1918
B. I. Miller	West Hartford, Conn.	1	July, 1919
J. K. Mitchell	Glasgow, Mont	1	February, 1919
C. M. Osborn	Kenosha, Wis	2	January, 1918
Harrison G. Otis	Clarksburg, W. Va	3	August, 1915
W. J. Oviatt	Villesca, Ia	1	May, 1919
R. L. Pickett	High Point.N. C	1	March, 1919
W. E. Reynolds	Alma, Mich	1	May, 1919
E. A. Rolison	Redding, Calif	1	August, 1918
Wilder M. Rich	Alexandria, Va	3	August, 1918
Kenyon Riddle	Kelsey City, Fla	4	July, 1914
R. W. Rigsby	Durham, N . C	2	May, 1919
Martin S. Ruby	Lubbock, Tex	1	December, 1917
L. L. Ryan	McCracken, Kans	1	May, 1919
J. H. Sanders	Crystal Falls, Mich	1	April, 1917
C. C. Schultz	Wilmette, Ill	1	August, 1917
H. H. Sherer	Glencoe, Ill	1	January, 1914
J. E. Smith	Clark, S. Dak	1	May, 1912
Geo. W. Thompson	Westmount, Que	1	April, 1913
Theo. H. Townsend	St. Johns, Mich	1	July, 1919
H. F. Traxler	Janesville, Wis	2	August, 1918
Dan H. Vincent	Big Rapids, Mich	1	July, 1918
Bert C. Wells	Atchison, Kans	2	July, 1917
W. H. Wigglesworth	Durango, Colo	1	April, 1919
H. L. Woolhiser	Winnetka, Ill	1	May, 1917

Preparing for Fire Prevention Week

NEW campaign literature, distributed for the first time this year, has been issued by the National Fire Protection Association, Boston, Mass., for use in connection with the 1924 Fire Prevention Week campaign. This includes the striking poster here reproduced, the original being in two colors, and measuring 12 x 16 inches.

FIRE PREVENTION WEEK POSTER

The new Fire Prevention Week Handbook is a 50-page manual for the guidance of committees planning Fire Prevention Week observances and of teachers and school officials interested in school fire prevention exercises. It is available at 15 cents per copy. Other material now ready for distribution includes a 4-page leaflet, "The Story of Fire Prevention Week," Fire Prevention Week stickers and speech texts, and a poster prize contest announcement.

Growth of the Safety Council Movement

THAT the promotion of human safety is fundamentally a community problem is evidenced by the mobilization of civic interests in 25 cities of the country to combat industrial and public accidents within the last six months. The number of communities now engaged in organized safety work is 60, with a combined population of more than 20,000,000 and a registration of 2,500,000 motor vehicles.

A SPEEDY TRUCK $1095

20% MORE POWER
17 MILES TO THE GALLON
WILLYS-KNIGHT MOTOR

Chassis f. o. b. Detroit

The advent of the new FEDERAL-KNIGHT marks a new era in truck transportation.

One hundred million dollars worth of Federal trucks in service testify to Federal efficiency and durability. The world-famous Willys-Knight motor adds new economies and satisfaction hitherto unknown in the motor truck field.

No valves to grind. No carbon-cleaning. Upkeep costs are cut 50%.

Long life is an attribute common to all Federal trucks. And long life has won international fame for the Willys-Knight motor. How long, no one knows. *No Willys-Knight motor has ever been known to wear out.*

The amazingly low first cost, and matchless economy in service, make this new Federal the greatest value ever offered in a high-speed truck.

FEDERAL MOTOR TRUCK COMPANY
DETROIT, MICHIGAN

FEDERAL-KNIGHT

A SPEEDY BUSINESS TRUCK

As defined by the National Safety Council, a Class A community safety council is an independent organization directed by a paid and full-time secretary-manager and operating on a yearly budget of approximately $10,000. Forty-two cities now have Class A councils, as follows:

Atlanta, Ga.
Baltimore, Md.
Battle Creek, Mich.
Bellingham, Wash.
Buffalo, N. Y.
Charleston, W. Va.
Chattanooga, Tenn.
Cincinnati, Ohio
Cleveland, Ohio
Denver, Colo.
Des Moines, Iowa
Detroit, Mich.
Everett, Wash.
Flint, Mich.
Fort Wayne, Ind.
Grand Rapids, Mich.
Jersey City, N. J.
Kansas City, Mo.
Knoxville, Tenn.
Louisville, Tenn.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
Nashville, Tenn.
Newark, N. J.
Norfolk-Portsmouth, Va.
Paterson, N. J.
Pittsburgh, Pa.
Portland, Ore.
Providence, R. I.
Reading-Berks, Pa.
Richmond, Va.
Rochester, N. Y.
St. Louis, Mo.
St. Paul, Minn.
San Antonio, Tex.
Seattle, Wash.
Spokane, Wash.
Springfield, Mass.
Syracuse, N. Y.
Washington, D. C.
Wilmington, Del.

More than 5,000 men and women influential in business, civic, social and educational circles are volunteer workers in local safety councils. These people are giving freely of their time and money in the work of preventing public accidents. A recent survey of schools shows that more than 2,000,000 school children are taking part in the community safety work as a part of their regular classroom work.

Government Aid to Housing in Canada

From a statement dated July 22, 1924, of the Department of Health of Canada, it is learned that up to March 31, 1924, 6,244 houses had been erected in 179 municipalities with the aid of government loans under the provisions of the General Project for Housing, enacted December 3, 1918. This law provides for the loan of moneys by the Federal Government of Canada to the Provincial Governments, the latter to loan said moneys to housing societies, companies or individual owners of lots. The total amounts loaned to the provinces up to the date mentioned were:

Manitoba	$1,975,000.00
New Brunswick	1,525,000.00
Ontario	9,350,000.00
British Columbia	1,701,500.00
Quebec	7,369,689.62
Nova Scotia	1,537,000.00
Prince Edward Island	50,000.00
	$23,508,189.62

Real Estate Boards Adopt Advance Code of Ethics

COMPLETE revision of the code of business ethics of the National Association of Real Estate Boards was voted at the closing general session of the Association's annual convention last month. "Underlying all is the land. Upon its wide utilization and widely allocated ownership depend the survival and growth of free institutions and of our civilization," the preamble of the new code states, setting forth the social responsibility of the Association and of the local real estate boards that make up its membership. "The realtor is the instrumentality through which the land resource of the nation reaches its highest use and through which land ownership attains its widest distribution. He is a creator of homes, a builder of cities, a developer of industries and productive farms. Such functions impose obligations beyond those of ordinary commerce."

The Busy Bee and the Traffic Lamp

A swarm of bees that clustered on the red globe of a traffic lamp on Main Street, Orange, N. J., one afternoon recently, attracted the attention of a large crowd of passers-by. While traffic officers and others debated on how best to dispose of the visitors, the problem was solved by an old colored man, who, seeing in the swarm a worth-while prize, gathered the bees into a small wooden box and departed.

The Legal Aspects of Milk Control

In *Public Health Reports* for July 18, 1924, James A. Tobey of the National Health Council, New York, has assembled a list of 121 court decisions of the highest courts of appeal in 31 states and the Federal Government which deal with some phase of milk regulation. In commenting on these decisions Mr. Tobey says, in part:

"On few public health subjects is there such a unanimity of opinion by courts of last resort as on milk control. The regulation of milk and milk supplies has been repeatedly upheld as a valid exercise of the police power. The police power is the inherent power of the state to enact laws, within constitutional limitations, to promote public safety, health, morals, comfort, and welfare.

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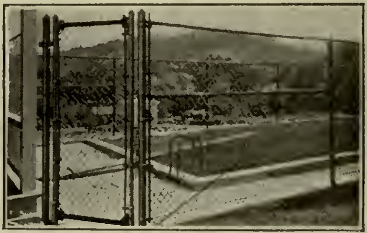

It was a power possessed by the states before they granted certain rights to the Federal Government, as incorporated in the Constitution, and it has never been relinquished by them. The police power is the basis of all public health work within the state. The United States Supreme Court, final arbiter on all matters arising under the Federal Constitution, has held on several occasions that milk regulations form a valid exercise of this police power."

Among the activities which have been upheld in these decisions are:

- Delegation of the power of control over milk to boards of health
- Fixing of standards of milk
- Regulation of the inspection of dairies and of cattle
- The tuberculin test
- Prevention of adulteration of milk, and penalties for it
- Licensing of milk dealers, dairies and sellers
- Destroying impure milk or that handled contrary to regulations
- Pasteurization or certification requirements.

Food Handlers Regulated

THE *California State Board of Health Bulletin* reports that Santa Ana has adopted an ordinance requiring the physical examination of food handlers, and that Orange will take similar action. Ordinances requiring the supervision and medical examination of food handlers are in force in Pasadena and Long Beach, and Bakersfield is considering a similar measure.

Per Capita Costs of Police Service in Twenty-Seven Cities

THERE are 33 cities in the United States with over 200,000 population. The Kansas City Public Service Institute has secured police statistics for 1923 from 27 of them and has compiled the following table from statistics received. The populations and areas used in the calculations are from the United States Bureau of the Census:

City	Per Capita Expenditures for Police Service	Population per Square Miles
Boston	$5.60	17,850
Philadelphia	5.16	15,020
New York	4.90	19,850
Newark	4.68	18,840
Providence	4.58	13,640
Detroit	4.43	15,180
St. Louis	4.33	13,190
San Francisco	4.30	12,840
Buffalo	4.20	13,800
Los Angeles	4.00	1,830
Washington	3.90	7,910
Baltimore	3.54	9,790
Kansas City	3.45	6,020
Seattle	3.24	5,840
Rochester	3.20	9,900
Cleveland	3.08	15,770
Indianapolis	3.07	7,850
Milwaukee	3.05	19,080
Portland	2.92	4,330
St. Paul	2.70	4,640
Minneapolis	2.50	8,220
Atlanta	2.48	8,320
Louisville	2.45	11,500
Denver	2.43	4,690
Cincinnati	2.36	5,720
Columbus	2.13	11,560
Akron	1.40	10,210

County and Municipal Expenditures, 1917 and 1923

A COMPILATION of total and per capita costs of government in the counties and municipalities of New Jersey has been made by Sedley H. Phinney, Secretary of the New Jersey State League of Municipalities, and is being sent to mayors and finance directors throughout the state. The costs (exclusive of school systems) are summarized in the following table:

		Expenditures in 1917		Expenditures in 1923	
Number	Governmental Units	Total	Per Capita*	Total	Per Capita*
21	Counties	$18,442,806.09	$6.14	$32,642,119.16	$9.70
47	Cities	32,090,427.50	18.10	56,201,206.10	28.20
24	Towns	4,598,624.03	13.50	7,468,347.29	18.70
208	Boroughs	4,000,420.06	11.85	8,673,119.89	16.80
234	Townships and 3 villages	3,503,582.13	6.96	6,597,140.45	13.75

Per capita costs have been used instead of tax rates because they are thought to be a more reliable criterion by which to compare. Tax rates are affected by the percentage of true to assessed valuations and these are very irregular throughout the state. Per capita costs, on the other hand, give a good basis for comparison except in the case of shore resort cities, in which the presence of large floating populations not counted in the census figures increases per capita costs. For example, the present average per capita cost in the shore cities is $77.50 and in the non-resort cities the average is $30.50.

Additional tables show the distribution of these costs between various functions of government, namely, police, fire, cleaning and maintenance of streets, collection and disposal of refuse, street lighting, public health and parks and recreation. For the entire municipal group, including cities, towns and boroughs, police expenditures are 15.5 per cent of the total in 1924. Fire department costs are 12.2 per cent of the total.

In a statement accompanying the report, Mr. Phinney pointed out that figures recently made public by the United States Census Bureau indicate that per capita costs of government in cities all over the country have about doubled in the last ten years. He said that the public expects and demands a better scale of municipal services than even a few years ago. These include municipal playgrounds, gymnasiums, swimming pools and golf links, better police regulation of traffic, municipal clinics for tuberculosis, dentistry, and other services; public water-supplies, with larger quantity, better quality and higher pressure, and many other services too numerous to mention. The great increase in the number of automobiles and the building of skyscrapers are factors that have added materially to costs of municipal government.

The complete report, a document of 34 mimeographed pages, can be had from Mr. Phinney at $1 per copy.

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* Based on estimated population for 1917 and 1923. These per capita figures apply to the 39 largest cities and 37 largest boroughs and to all the counties, towns, townships, and villages.

IN CLOSE AGREEMENT

The Consumers Gas Co. of Reading, Pa., recently compared the reading of their Venturi Station Gas Meter and a drum type meter by two two-hour tests. The Two Meters Agreed Within One Percent.

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Elements of Forestry.—By Franklin Moon, B. A., M. F., Dean, New York State College of Forestry at Syracuse University; and Nelson Courtlandt Brown, B. A., M. F., Professor of Forest Utilization, New York State College of Forestry at Syracuse University. 1924. John Wiley & Sons, Inc., New York. Second edition, revised and reset. XVII + 409 pp. Illustrated. $3.50.

The new edition of this text-book has been entirely brought up to date with special reference to the progress of forestry in the last ten years. There are two new chapters, on State Forest Activities and National Forest Activities. Others besides students in the classroom will find of value the material it contains, and will be directed by its use to sources of information on a subject which either directly or indirectly affects every individual.

Forestry Almanac.—Compiled and edited by The American Tree Association, 1214 16th Street, N. W., Washington, D. C. 1924. VIII + 225 pp. Illustrated. $2.00.

This is the first and only book of its kind in the world. It contains in almanac form all the important available information regarding the forestry movement, showing simply and directly what has been done through organized agencies and what may yet be accomplished. Charles Lathrop Pack, President of the Association, says, "We must put 81 million acres of idle land to work growing trees." This volume presents the means by which such a goal may be approached.

Facts on the Public School Curriculum.—In the Research Bulletin of the National Education Association, Vol. 1, No. 5. 48 pp. Tables. Containing material under the following heads: Shaping the Nation's Growth Through the Public School Curriculum; Statutory and State Board of Education Requirements Relative to Elementary Schools Curricula; Facts on Time Allotments for Subjects in Elementary Schools and Junior High Schools; Vote of Expert Opinion on Most Helpful Books Dealing With Curriculum Problems, together with Selected Annotated Bibliography; New Coursea of Study for Old. (Apply to the Association, 1201 Sixteenth Street, N. W., Washington, D. C.)

Suggested Tests for Patrolman.—By Fred Telford and F. A. Moss. 12 quarto pp. In Public Personnel Studies, July, 1924. The preliminary subject matter deals with the causes for the general dissatisfaction with the police administration, and the qualifications of a patrolman. The tests suggested for use in selecting patrolmen represent the authors' best judgment, based on existing civil service and psychological practice, and both the form and content of the tests have been tried out, although not technically standardized. 35 cents. (Apply to Bureau of Public Personnel Administration, Institute for Government Research, 26 Jackson Place, Washington, D. C.)

City Managership as a Profession.—By Joseph A. Cohen, Harvard College. 21 pp. as supplement of the National Municipal Review for July, 1924. Setting forth the qualifications, training, tenure, salary, promotion, and public relationships of the city manager. (Apply to the National Municipal League, 261 Broadway, New York, N. Y.)

Town Planning Institute of Canada.—The Annual Conference Number (June, 1924) of The Journal of the Town Planning Institute of Canada, giving the major portion of the transactions, together with reports from the provinces which may be taken to reflect the status of town planning throughout the Dominion. 24 quarto pp. Map. (Apply to John M. Kitchen, Secretary-Treasurer of the Institute, Ottawa, Ontario.)

Transportation of Milk by Motor Truck.—18 quarto pp. in Public Roads, a journal of highway research published by the Bureau of Public Roads of the U. S. Department of Agriculture. July, 1924. Illustrated. Giving the results of a survey of milk transportation for Philadelphia, Detroit, Baltimore, St. Paul, Minneapolis, Milwaukee, Cincinnati, and Indianapolis. Prepared by Henry R. Trumbower, Economist, U. S. Bureau of Public Roads. 10 cents. (Apply to the Government Printing Office, Washington, D. C.)

Diesel and Oil Engineering Hand Book.—By Julius Rosbloom. 1924. Technical Publishing Company, Los Angeles, Calif. Second Enlarged Edition, 780 pages. $5.

A very complete and practical book of instructions and ready reference on oil engines of the high-compression type, describing also compressors, pumps, and such equipment as is necessary in oil engine installation, and Diesel electric drives. The book is profusely illustrated and contains a large number of questions and answers, tables, formulae, etc. The text includes the general discussion of the leading types of Diesel engines; a detailed description of the various types of Diesel machinery with operating instructions, emergency repairs, etc.; a chapter on Diesel electrical drives; a chapter on technical terms and formulae for the practical operation of this type of prime mover; a discussion of auxiliary machinery, fuels and lubricants, and other text particularly useful to the municipal power-plant engineer.

Municipal Street Cleaning in Philadelphia.—An analysis of the problem of street cleaning and refuse collection and disposal, with an evaluation of the results attained during the first year of city-wide municipal operation. Prepared by the Bureau of Municipal Research of Philadelphia. June, 1924. 109 pp. Chart, tables. (Apply to the Bureau.)

The Relation of Sewage Disposal to Water Supply.—By Jack J. Hinman, Jr. Presented at the Fifth Conference on Sewage Treatment, at Ames, Iowa, October 22-24, 1923. Bulletin 64 of the Engineering Extension Department, Iowa State College, Ames, Iowa. May 7, 1924. 12 pp. Illustrated. One of the general papers presented at the Conference. (Apply to author, Post Office Box 313, Iowa City, Iowa.)

A Major Traffic Street Plan for Los Angeles.—Prepared for the Committee on Los Angeles Plan of Major Highways of the Traffic Commission of the City and County of Los Angeles, by Frederick Law Olmsted, Harland Bartholomew, and Charles Henry Cheney, Consulting Board. P. P. Sharples is the Chief of Staff. 1924. 72 quarto pp Maps, diagrams, charts, tables. A close study of the main body of the city, with a consideration of thoroughfare planning throughout the metropolitain district, with the idea of providing a broad, practical, well-balanced scheme for handling traffic, to which the city may gradually adjust itself. (Apply to the Committee, 215 Wright-Callender Bldg., Los Angeles, Calif.)

Prejudice or Foreigners.—By Charles F. Weller, of the League of Neighbors, Elizabeth, N. J. An 8-page folder, pleading for good-will and the spirit of service in overcoming prejudice towards foreigners, in order that unity of community life may be secured. "America's fundamental error is in thinking of her immigrants as liabilities rather than assets." A stirring presentation of the principles of democracy on which the League of Neighbors in Elizabeth is based. (Apply to the author.)

Licensing Transient Merchants and Peddlers.—A model ordinance. By Ambrose Fuller, member of the Minnesota Bar, with the St. Paul Bureau of Municipal Research. Publication No. 4 of the League of Minnesota Municipalities. June, 1924. 10 pp. Discussing some main phases of the problem, which is "as old as civic life itself." (Apply to the Municipal Reference Bureau, University of Minnesota Library, Minneapolis, Minn.)

New Haven Council of Social Agencies.—Report of the Survey Committee to the Executive Committee, Part I: Child Welfare Work; Family Welfare Work; Work for Homeless and Transient Men. 1924. 24 pp. The survey was undertaken in response to a request from the Community Chest for fuller knowledge of conditions and measures that would tend towards economy, efficiency and greater helpfulness. Each recommendation of the Survey Committee is coupled with the analysis of the particular problem to which it applies. The report is thus essentially frank and practical. (Apply to Otto Davis, Executive Secretary, The New Haven Council of Social Agencies, 82 Church Street, New Haven, Conn.)

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Selecting Employees for Public Service.—Methods of Selecting Employees to Fill High Grade Positions in the Public Service. The March-April, 1924, issue of Public Personnel Studies, published by the Bureau of Public Personnel Administration, Institute for Government Research, 26 Jackson Place, Washington, D. C. 59 pp. Explaining the theoretical and practical considerations involved in making the selection through competitive tests conducted by the central employment agency, showing the extent to which such agencies have conducted tests to fill vacancies in high-grade public service positions, and the kind of tests used, and stating opinions as to the success attained. (Apply to W. F. Willoughby, Director of the Bureau.)

Thames Valley Regional Plan.—Preliminary Report of the Joint Town Planning Committee upon the Regional Survey. By Thomas Adams and Longstreth Thompson, town planning consultants, 121, Victoria Street, London, S. W. 1, England. September, 1923. 53 quarto pp. Maps, diagrams, tables. The land in the Thames region is mainly used for residence and recreation, manufacturing being of secondary importance and considered in this survey principally from the view-point of preventing industries from injuring other uses of the land. The scope of the survey and plan includes; main transport routes; zoning proposals; density provisions and proposals as to building lines and heights; open spaces; sites for civic centers; places for shopping centers. The plan aims, not to eliminate local town planning schemes, but to bring about voluntary local collaboration in an acceptable general plan. (Apply to the consultants.)

Sanitary Engineering in Virginia.—Report of Division of Sanitary Engineering, reprinted from the Biennial Report of the State Board of Health for 1921-1923, in the April, 1924, issue of the Virginia Health Bulletin, published by the State Board of Health. 37 pp. Diagrams, tables. This report covers the progress made in water and sewerage improvements, with especial consideration of filtration and chlorination. The tables give details regarding chlorination plants throughout the state, the ownership of the water-works, and the purity of the supplies. Valuable information about the principal investigations in certain towns is given, also important details of the methods used in the sterilization of swimming pools. (Apply to Richard Messer, Chief Engineer, State Board of Health, Richmond, Va.)

A Fuel Program for the City of Buffalo, N. Y.—By G. S. Brewer, Assistant Fuel Engineer, U. S. Bureau of Mines, and Benjamin Joy Hatmaker, Consulting Geologist, Department of Public Works, Buffalo, N. Y. Published by cooperative agreement between the Bureau of Mines, Department of the Interior, and the city of Buffalo. 88 pp. Map, charts, tables. This report has been formulated with the idea of attaining the ultimate elimination of smoke, and of guarding the people of Buffalo against the current annoyances due to a chaotic fuel situation, especially a shortage of gas supply at times when it is most needed. (Apply to Department of Public Works, Buffalo, N. Y.)

Books for Social Workers.—A selected list compiled and annotated by the St. Louis Library School, Class of 1924, at the request of the Community Council of St. Louis. 43 pp. in the Library School Number (June, 1924) of the St. Louis Public Library Monthly Bulletin. (Apply to Arthur E. Bostwick, Librarian, St. Louis, Mo.)

Regulation of Plumbing.—Recommended Minimum Requirements for Plumbing in Dwellings and Similar Buildings. Final report of Subcommittee on Plumbing of the Department of Commerce Building Code Committee, submitted July 3, 1923. In the Elimination of Waste Series published by the United States Department of Commerce. Published 1924. XV + 260 pp. Drawings, charts, tables. The subject is considered from the point of view of the sanitarian, manufacturer, plumber, and inspector, but first of all in relation to the health and comfort of the house dweller. The Subcommittee, appointed by Secretary Hoover in 1921, was as follows: George C. Whipple, Chairman, Professor of Sanitary Engineering, Harvard University; Harry Y. Carson, research engineer, American Cast Iron Company, Birmingham, Ala.; William C. Groeniger, consulting engineer, Columbus, Ohio; Thomas F. Hanley, of Hanley & Company, mechanical engineers and contractors, Chicago; A. E. Hansen, hydraulic and sanitary engineer, New York City; James A. Messer, President, James A. Messer Company, Washington, D. C.; William J. Spencer, Secretary-Treasurer, Building Trades Department, American Federation of Labor; Albert L. Webster, consulting engineer, New York City. 35 cents. (Apply to the Government Printing Office, Washington, D. C.)

Tractive Resistance and Related Characteristics of Roadway Surfaces.—By T. R. Agg. An investigation conducted by the Iowa Engineering Experiment Station in cooperation with the U. S. Bureau of Public Roads and the Iowa Highway Commission. Bulletin 67 of the Engineering Experiment Station. February 6, 1924. 62 pp. Views, charts, tables. (Apply to Iowa Engineering Experiment Station, Ames, Iowa.)

The President's Conference on Outdoor Recreation.—The Conference was held in Washington, D. C., May 22-24, 1924. Addresses, resolutions, etc., reported in the July number of The Playground. 80 pp. 40 cents. (Apply to The Playground and Recreation Association of America, 315 Fourth Avenue, New York, N. Y.)

Municipal Drug Control.—By Charles V. Craster, M. D., Newark, N. J. 4 pp. in the May, 1924, issue of the Monthly Bulletin of the Department of Health, Newark, N. J. An address read before the Central Atlantic States Association of American Dairy Food and Drug Officials at New York, April 28, 1924, setting forth the need of control of the purity and strength of drugs, and the standards of their manufacture, showing what the legal requirements are, and giving incidents illustrative of the benefit of drug supervision. (Apply to the Department of Health, Newark, N. J.)

Relieving Congestion on Atlanta's Streets.—Reprinted from Electric Railway Journal of March 15, 1924. 3 quarto pp. A review of the preliminary report made to the City Council of Atlanta by John A. Beeler, consulting engineer, of New York City. This report recommends making changes in Atlanta's downtown district, relocation and wider spacing of car stops, double berthing, additional raised safety loading platforms, more street collectors, parking restrictions, and coordinating the movement of other traffic with those of the street cars. (Apply to The Beeler Organization, 52 Vanderbilt Avenue, New York, N. Y.)

What Planning Has Done for Cities.—By George B. Ford, President, National Conference on City Planning. 1924. 21 pp. An analysis of the results of a questionnaire sent out by the Conference to about 200 cities known for their planning activity. The various kinds of planning are shown and typical projects are considered, with effective methods of getting the plans authorized and paid for, and statements of saving in money or convenience, safety and beauty. (Apply to Flavel Shurtleff, Secretary of the Conference, 130 East 22nd Street, New York, N. Y.)

City Planning in Somerville, Mass.—Annual Report of the Somerville Planning Board for the Year 1923, together with Preliminary Survey and Program for a City Plan, prepared by the Technical Advisory Corporation, consulting engineers, 15 Park Row, New York, N. Y. 128 pp. Illustrated. The report of the Planning Board summarizes its previous recommendations and outlines the present status of the city planning work in Somerville, with the Board's recommendations for the future. An interim zoning ordinance is given. Most of the sections of the consultants' report are followed by definite recommendations, effectively displayed, regarding town action on the points under discussion. The Program is in two sections: Matters Requiring Immediate Action; Matters Requiring Action in Near Future. (Apply to the consulting engineers.)

American Association for Promoting Hygiene and Public Baths.—Journal of the Association, Volume VI. April, 1924. 117 pp. Illustrated. Containing, besides notes and comment on various matters connected with the Association and its work, the report of the annual meeting of the Association in 1923, with many papers. Subscription, $1 per year. (Apply to Arthur Morton Crane, Manager of the Journal, Roselle Park, N. J.)

Centralized Purchasing.—Two pamphlets by Russell Forbes, Research Secretary, National Association of Purchasing Agents: "Centralized Purchasing—A Means of Tax Reduction," 20 pp., originally published in the Tulsa Tribune; "Centralized Purchasing in Governments of United States and Canada," reprinted from "Competency and Economy in Public Expenditures," in the May, 1924, issue of the Annals of American Academy of Political and Social Science, 15 pp. The first is made up of suggested charter provisions to establish central purchasing in Tulsa, Okla., and a number of articles in easy style presenting the principles and advantages of this method. Both pamphlets are illustrated with charts. (Apply to W. L. Chandler, Secretary of the Association, Woolworth Building, New York, N. Y.)

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New York State Commission of Housing and Regional Planning.—Regional Planning; The Work of the Commission. News Bulletin No. 1 issued by the State of New York Bureau of Housing and Regional Planning, 949 Broadway, New York, N. Y. June, 1924. 6 mimeographed pp. The article on Regional Planning is by Clarence S. Stein, Chairman of the Commission. The outline of the work of the Commission covers the period since its creation in May, 1923. (Apply to George Gove, Director of Investigations.)

Service Relations of Town and Country.—The Service Organization of Town and Country.—A Brief of Findings and Principles. Published, December, 1923, as Research Bulletin No. 58 of the Agricultural Experiment Station of the University of Wisconsin and the United States Department of Agriculture Cooperating. By J. H. Kolb, of the Department of Agricultural Economics of the University. 78 pp. Charts, tables. All of Dane County was considered for certain parts of the study. Four towns in the eastern part were then studied intensively and then farm families living in their service areas were visited. Elkhorn, in Walworth County, and Waupaca, in Waupaca County, were studied to serve as checks on tendencies discovered in the first county. The facts presented and the conclusions drawn from them are worth the study of chamber of commerce secretaries who are interested in the relations between business men and farmers. Free to residents of Wisconsin; others send 25 cents. (Apply to the Agricultural Experiment Station, Madison, Wis.)

Ten Years of the Merit System.—How It Has Operated in the State, Counties and Cities of Ohio. 5 quarto pp. in the May, 1924, issue of "Greater Cleveland," published by The Citizens League of Cleveland, 1307 Swetland Building. Replying to the question: "Why is the law not enforced?" (Apply to the League.)

Health for the Family.—Three 4-page leaflets published by the New York Tuberculosis Association, 10 East 39th Street, New York, N. Y.: "Health for Young Men and Women"; "Good Health in the Middle Years"; "Comfort and Safety for the Older Folk." Each with attractive cover drawing. Containing practical advice on the preservation of health. (Apply to the Association.)

School Publicity.—Special School Publicity Number of the Educational Research Bulletin of the College of Education, of Ohio State University, Columbus, Ohio. April 16, 1924. 24 pp. Containing the following material: "Continuous School Publicity," by G. W. Grill, Clerk, Board of Education, Lakewood, Ohio; "The Schools and the Newspapers," by Clyde R. Miller, Director of Publications, Cleveland Public Schools; "Selected Bibliography on School Publicity," by L. Belle Voegelein, Bureau of Educational Research; "Securing Support on the Basis of Value," by the Editor, B. R. Buckingham; and "A Cooperative Study of School Publicity," by P. R. Stevenson, of the Bureau, who compiled this number of the Bulletin. (Apply to the Bureau of Educational Research, Ohio State University, Columbus, Ohio.)

Plumbing Code, Chicago.—Edition of 1924. Pocket size. 50 pp. 25 cents. (Apply to Frederick Rex, Librarian, Municipal Reference Library, 1005 City Hall, Chicago, Ill.

The Bonded Debt of 201 Cities as at January 1, 1924.—By C. E. Rightor, Chief Accountant, Detroit Bureau of Governmental Research. Reprinted from National Municipal Review for June, 1924. 9 pp. Tables. A statement of the total amount of bonds outstanding as a liability against the property in each city, classified by purpose; the sinking fund, similarly classified; the net total bonded debt; and the per capita net bonded debt. Within the five population groups recognized by the Census Bureau, the cities reporting are then ranked according to the per capita net debt. (Apply to the National Municipal League, 261 Broadway, New York, N. Y.).

International Association of Street Sanitation Officials.—Report of Proceedings of Fourth Annual Conference, held in Chicago September 27-29, 1923. 28 quarto pp. Illustrated. (Apply to A. M. Anderson, Secretary of the Association, 10 South La Salle Street, Chicago, Ill.)

Weights and Measures.—Report of the Sixteenth Annual Conference on Weights and Measures of the United States, held at the Bureau of Standards, Washington, D. C., May 21-24, 1924. An abridged account, retaining as much as possible of the permanently useful material. Miscellaneous Publications No. 55 of the Bureau of Standards. Price, 30 cents. 153 pp. Illustrated. The purpose of the Conference is to bring about in the states and municipalities the uniformity of practice as to weights and measures that is shown to be needed. George K. Burgess, Director of the Bureau of Standards, is the President of the Conference. (Apply to the Government Printing Office.)

Some Problems in the Operation of Imhoff Tanks.—By Earle L. Waterman, Associate Professor of Sanitary Engineering, University of Iowa. Presented at the Fifth Conference on Sewage Treatment at Ames, Iowa, October 22-24, 1923. Bulletin 59 of the Engineering Extension Department, Iowa State College, Ames, Iowa. 12 pp. Illustrated. This is one of the more general papers presented at the Conference, and discusses briefly the principles on which the Imhoff tank is designed, with an outline of operating procedure and special emphasis on particular problems. (Apply to the Engineering Extension Department.)

Park Districts in Chicago.—A 2-page mimeographed description of the park administration in Chicago, which involves "an extraordinary list of separate authorities, unparalleled in this or any other country." Issued by the Bureau of Statistics and Municipal Reference Library, 1005 City Hall, Chicago, Ill. (Apply to Frederick Rex, Municipal Reference Librarian.)

American Foundations.—A selected bibliography on American Foundations for Social Welfare. Bulletin No. 65 of The Russell Sage Foundation Library. June, 1924. Revised edition. Giving not only the official publications relative to the various Foundations, but explanations of the purposes of the Foundations and the names and addresses of their principal officers. 35 pp. (Apply to Frederick Warren Jenkins, Librarian, The Russell Sage Foundation Library, 130 East 22nd Street, New York, N. Y.)

Statutory Limitations on Property Taxation in Minnesota.—By Bryce E. Lehman, Assistant, Bureau of Research in Government, University of Minnesota. Publication No. 5 of the League of Minnesota Municipalities. June, 1924. 12 pp. Tables. (Apply to the Municipal Reference Bureau, University of Minnesota Library, Minneapolis, Minn.)

Official Directory of the City of New York.—The 1924 edition. Prepared under the direction of Peter J. Brady, Supervisor of the City Record, and compiled by William Viertel, Editor of the City Record. 280 pp. Containing the names, addresses and telephone numbers of city, county and borough officials in New York City, and the names of the state and Federal officials, with additional important and useful information. There is a new section giving "Changes Since 1923 Directory Due to Acts of State Legislature and Ordinances of Board of Aldermen." Paper, 15 cents; leather, 30 cents. (Apply to Board of City Record, Room 812, Municipal Building.)

Palisades Interstate Park.—Twenty-fourth Annual Report of the Commissioners. January 31, 1924. Legislative Document (1924) No. 85. 20 pp. Illustrated. An interesting account of the recreational facilities of the park and the way in which they have been used and appreciated. (Apply to William A. Welch, Chief Engineer of the Board of Commissioners, 25 Broadway, New York, N. Y.)

Types of Streets in the City of Chicago.—By F. E. Sullivan. A report of a thorough and intelligent investigation of the possible type of pavements to be used in all areas of Chicago. 5 pp. in the Journal of the Proceedings of the City Council of Chicago for May 28, 1924. (Apply to Frederick Rex, Municipal Reference Librarian, 1005 City Hall, Chicago, Ill.)

American Child Health Association.—Transactions of the first annual meeting of this association, which was formerly the American Child Hygiene Association and the Child Health Organization of America. The meeting was held at Detroit, Mich., October 15-17, 1923. 508 pp. Valuable papers and discussion on many divisions of this field. Herbert Hoover said in his presidential address: "Our new field is the systematic determination of the shortcomings in child health protection, community by community, and the demonstration of remedy." (Apply to Philip Van Ingen, M. D., Secretary of the Asociation, 370 Seventh Avenue, New York, N. Y.)

The Importance of Citizens' Committees in Securing Public Support for a City Planning Program.—By John Nolen, town and city planner, Cambridge, Mass. 26 pp. Published by the National Conference on City Planning. 1924. With a bibliography on city planning publicity. Showing the services that citizens' committees can render, and giving concrete illustrations of such services in various cities. (Apply to Flavel Shurtleff, Secretary, National Conference on City Planning, 130 East 22nd Street, New York, N. Y.)

The Constitution of the United States.—By Raymond Garfield Gettell, Professor of Political Science in the University of California. VIII + 213 pp. A study of the fundamental ideals, principles and institutions of American government, intended primarily as a textbook in high schools, academies and normal schools. 80 cents. (Apply to Ginn and Company, Boston, Mass.)

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408 Security Building, Los Angeles, California

From the International Union of Cities

Items translated from "Tablettes Documentaires Municipales" by Stephen Child, 538 Merchants Exchange Building, San Francisco, Calif., to whom requests for further information regarding this source of civic documentation should be addressed

City Planning an International Movement. 71 (063)

During the past month (July, 1924), there have been held at Amsterdam, Holland, two meetings of the greatest importance. The first of these was an International Congress of Cities organized by the International Union of Cities. The first session of this organization was held in Gand in 1913. This, its second regular meeting, held under the patronage of the city of Amsterdam, has for its objects (1) the permanent cooperation between municipalities of the world for the distribution of their civic documentation data, and (2) discussion as to how the municipalities of the many countries of the world may contribute to the work of the Society of Nations. Other reports were submitted upon the various phases of municipal life, notably in regard to public health and social uplift.

The International City Planning Conference, held also at Amsterdam at the same time, was organized by the International Garden Cities and Town Planning Federation. The principal subjects under discussion were: regional planning in relation to the life of our great cities; and parks, systems of parks and recreation in general.

The Transformation of Rome. 71.311 (45.632)

The Eternal City has recently undergone notable changes. The growth in population during and since the war has been enormous, resulting in intense traffic congestion and a serious shortage of housing accommodations, in spite of the laying out of several new quarters or districts. Complaint is made by some that, in the course of these recent "improvements," numerous interesting nooks and corners have been rendered ugly rather than beautiful.

The Belgian Government's Aid to Housing in 1924. 33.332:35.078.5 (493)

The Belgian Government some years ago authorized the formation of the "Société Nationale des Habitations à bon Marché," for the purpose of helping forward the work of building inexpensive homes. Each year this organization has received large sums of money from the Government—never, however, large enough to really solve the housing shortage of this thriving little nation. It is interesting to note that for the year 1924 the Belgian Government has included in its budget the following items affecting the work of this National Society:

1. Discharging one-quarter of the 66 annuities previously granted at 2.75 per cent
2. Authorizing the participation by the National Government, through the means of this National Society, in the formation of the capital of local building societies to the extent of 1,000,000 francs
3. Placing at the disposal of the National Society, for advances or loans at 2 per cent to the local building societies, a credit of 100 million francs
4. Authorizing premiums to be granted to individuals in straitened circumstances (principally those suffering from war losses) to the extent of 10,000,000 francs

A New Process of Making Brick in England. 66.67 (42)

A new process has lately been patented in England for the manufacture of brick. The earth is dried and pulverized and then ground up with a denifite quantity of water which is forced into the mixture in small drops, and just enough water to produce the required consistency. The mixture is then pressed into the molds and afterward baked. The process permits the employment of soil not heretofore utilized by former methods. The bricks thus formed are regular in shape and show a strong resistance to the absorption of water. The process, if it proves as efficacious as announced, will be extremely important to all brick-using countries.

Compressed Cork as a Means of Reducing the Cost of Building Houses. 69.1

Cork is well known as a cheap and light material. The industry of cork-making has its most important center of production in France in the district known as "Lot-et-Garonne" and in the "Var." But this industry utilizes only the cork bark of the female species of cork-oak. There has therefore in the past been an immense amount of unused cork-bark-oak. To-day the manufacture of compressed cork bark is accomplished from both the male and female varieties of this tree and has found application in many ways. Remembering the marvelous qualities of cork for repelling heat, the Swiss have been notably ingenious in making this material play the role of first importance in housing construction. As it is easy to prepare this material in panels, they have hit upon the idea of adapting these panels, which are really very fragile and easily broken, by framing them in metal, cement or wood frames and substituting these framed panels for the cork pith formed into briquettes (an expensive and slow process). There is economy in the use of this material, for, being light weight, foundations may be lighter; and there is economy also in time of construction. The outside of buildings thus erected are covered with a coat of cement plaster. The cork mixed in this way is molded like artificial stone. It is quite non-inflammable, and Swiss insurance companies do not discriminate in regard to its use as compared with other materials. This material, of which an abundance may be found in France, offers interesting industrial possibilities and a great saving in the building of inexpensive homes and therefore in solving the housing shortage.

The Government of Holland Controls the Water Supply of the Entire Country. 35.170 (492)

After a characteristically thorough investigation, Holland has decided that the effect on the health of the community of the proper supply and distribution of water is of such importance that this problem must be controlled by the nation and not by local interests.

River or Surface Water Transformed into Underground Water. 62.811 (43.58)

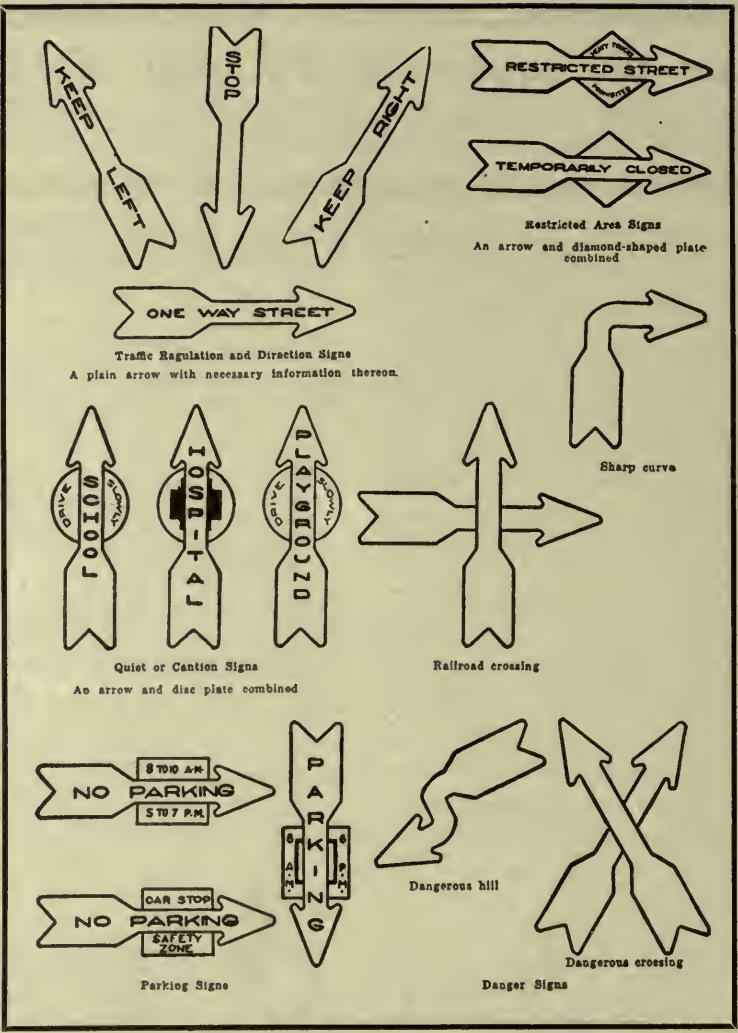
In the province of Hesse, Nassau, Germany, there has been proposed the possibility of producing, artificially, subterranean water from surface water. A method of this sort has been applied at Frankfort on the Main, where surface water pumped from the River Main is first purified in preliminary filters, then in a very fine filter. Following this the water is carried down underground to a depth of 2 metres, where, finely divided, it is filtered through 13 meters and intimately mixed with underground water. By this process the problem of furnishing water to the city of Frankfort has been assured for several generations. The water thus obtained is said to be quite on a par in quality with pure underground water and much better than surface water otherwise purified.

Special Separate Ways for Autos in Italy and England. 62.571.13

As a result of the constant increase in both weight and speed of automobiles, as well as their importance in traffic, the construction of ways especially for autos has become very desirable. For these reasons powerful associations in both Italy and England have now proposed this solution, which has received definite approval in Italy. The cost will be made good, thanks to the preparation of special laws, through charges or tolls laid upon the vehicles using these new ways.

The Problem of the Regulation of Traffic in Buenos Aires. 65.611:35.181.11 (82.12)

The traffic problem in this thriving South American city is acute, on account of the many narrow streets in the older portions of the city; the great increase in population and in commerce, and the use of these narrow streets by tramways. The concentration of the greater part of the wholesale business and of the public administration offices within a very limited area is a supplementary cause of traffic congestion. Different means of facilitating and ameliorating the circulation have been proposed, but have not produced very satisfactory results. What appears to be inevitable is the widening and extending of streets, the reduction of crossings, the diminution of congestion due to the tramways, and the decentralization, as far as possible, of business and administrative offices. It is realized that the building of subways would not help the congested condition, unless accompanied by a diminution of the number of vehicles in circulation. It is believed necessary to replace the tramways by motor busses in the center of the city where streets are narrow.



Standard Arrow Signs have been adopted by the International Association of Chiefs of Police as the logical solution of universal traffic regulation. These signs are being used by

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The English Architect and City Planning. 71

The Royal Institute of British Architects has decided to create a special diploma in City Planning. The Council has proposed the following general principles: (1) Each city possesses a special individual character which should find its expression in the plan. (2) All natural beauties, such as hills, forests, remarkable trees, brooks and lakes should not only be respected but emphasized. It is necessary to make them assume a definite part in the plan as important and determining factors. (3) The principal lines of transit should have their direction defined and always with reference to the topography. (4) The art of planning, this art of combining with judgment and with taste numerous elements, is quite as essential to the success of planning for a district or a suburb as it is for a project for a great building. A plan which is only a geometric, technical, rule-of-thumb plan is not sufficient. (5) Long straight streets when adopted should have a definite purpose. (6) Points of view should in general be limited to that which the sight may readily comprehend. All panoramas or general views should as far as possible be given an appropriate frame. (7) The grouping and arrangement of principal buildings and of open spaces should be studied with a view to producing happy architectonic ensembles and no project of city planning may be regarded as satisfactory that does not include sufficient open spaces.

The Demolition of Paris Fortifications. 71.31 (44.361)

Of the 94 bastions forming the fortification belt of Paris, 79 are condemned, 39 are already torn down and 7 in course of being removed. The expense already incurred or provided for amounts to 28,760,067 francs. They have salvaged 4,650 cubic meters of cut stone; 37,300 cubic meters of "millstone" and 193,000 cubic meters of ashlar masonry. About 70 acres of the cleared ground is to be devoted to the erection of inexpensive homes, about 18 or 20 acres to the University of the City of Paris, and nearly 25 acres to multi-family dwellings or apartments to be rented at moderate rates. According to a statement of the different expenses already incurred in the work and in the preparation for better planning for this area, the total amount to be expended will be something over one hundred million francs.

The Heating of Houses. 66.297

The expert Dr. E. Griffiths has been experimenting with regard to the conductability of heat by various types of house walls. He claims that a wall nine inches thick built entirely of cement allows 72 per cent more warmth to pass through it than the same thickness of wall built of ordinary or "stock" brick, and that a wall of cinder cement permits 10 per cent more heat to pass than a brick wall of similar thickness. A large surface of glass renders a house less warm.

The Regulation of the Flow of the Seine. 6.74 (44.361)

The eminent French engineer, M. Henri Chabal, has been studying the problem of regulating the flow of water in the Seine basin. It is now proposed to store the run-off in 23 large reservoirs with a capacity of 2,325,000,000 cubic meters. In 1910 the water in the Seine at Pont Tournell reached an elevation of 8.48 meters. This new project will prevent the river ever rising higher than 4.9 meters at this point. The emptying of these great reservoirs will take place at reasonable times, permitting 16,000,000 cubic meters a day during the five months of the dry season. The work will be accomplished in two stages, the first of which will cost 680,000,000 francs, and the total cost will be 1,700,000,000 francs. Besides this, hydro-electric power will be developed at the various falls of the reservoirs and hydro-electric works will be combined with a number of the navigation dams. The water accumulated will be allowed to irrigate about 8,000 acres. Navigation service will be aided as well as the revenue of the Port of Paris and of other projected ports in the neighborhood.

On the Calendar of Conventions

SEPTEMBER 9-11.—READING, PA.
Pennslyvania State Association of County Commissioners. Annual convention. Secretary, L. C. Norris, Clearfield, Pa.

SEPTEMBER, 10-12.—MONTREAL, QUE.
Canadian Tax Conference. Canadian Civil Service Conference. Annual convention. Secretary, Horace L. Brittain, 189 Church Street, Toronto, Ont.

SEPTEMBER 15-19.—ST. LOUIS, MO.
National Tax Association. Annual conference. Secretary, Alfred E. Holcomb, 195 Broadway, New York, N. Y.

SEPTEMBER 23-25.—MONTREAL, QUE.
City Managers' Association. Annual convention. Executive Secretary, John G. Stutz, Lawrence, Kans.

SEPTEMBER 29-OCTOBER 2.—BOSTON, MASS.
American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, P. O. Box 1134, Lakeland, Fla.

SEPTEMBER 29-OCTOBER 3.—LOUISVILLE, KY.
National Safety Council. National Safety Congress. Secretary, W. H. Cameron, 168 North Michigan Avenue, Chicago, Ill.

SEPTEMBER 30-OCTOBER 3.—ROCHESTER, N. Y.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

OCTOBER 6.—WORCESTER, MASS.
Massachusetts Federation of Planning Boards. Annual conference. Secretary, Arthur C. Comey, Abbot Building, Harvard Square, Cambridge, Mass.

OCTOBER 6-9.—WASHINGTON, D. C.
American Red Cross. Annual convention. Secretary, Mabel T. Boardman, National Headquarters, Washington, D. C.

OCTOBER 6-9.—WASHINGTON, D. C.
American Institute of Park Executives. Annual convention. Secretary-Treasurer, Will O. Doolittle, Box 548, Minot, N. Dak.

OCTOBER 6-10.—MONTEREY, CALIF.
League of California Municipalities. Annual convention. Executive Secretary, William J. Locke, Room 707, Chancery Building, San Francisco, Calif.

OCTOBER 16-17.—COLUMBUS, OHIO.
Ohio State Conference on City Planning. Annual conference. Secretary-Treasurer, Charlotte Rumbold, 201 Chamber of Commerce Building, Cleveland, Ohio.

OCTOBER 8-10.—WASHINGTON, D. C.
American Civic Association. Annual convention. Secretary, Miss Harlean James, Union Trust Building, Washington, D. C.

OCTOBER 8-10.—EMPORIA, KANS.
League of Kansas Municipalities. Annual convention. Secretary-Treasurer, John G. Stutz, Lawrence, Kans.

OCTOBER 14-16.—KANSAS CITY, MO.
American Child Health Association. Annual meeting. Secretary, Dr. Philip Van Ingen, 370 Seventh Avenue, New York, N. Y.

OCTOBER 14-17.—AUGUSTA, GA.
International Association of Municipal Electricians. Annual convention. Secretary, W. R. Arbuckle, Bayonne, N. J.

OCTOBER 16-21.—ATLANTIC CITY, N. J.
Playground and Recreation Association of America. Annual recreation congress. Secretary, H. S. Braucher, 315 Fourth Avenue, New York, N. Y.

OCTOBER 20-22.—WASHINGTON, D. C.
National Association of Commercial Organization Secretaries. Annual meeting. Secretary, Raymond B. Gibbs, Chamber of Commerce, Kansas City, Kans.

OCTOBER 20-23.—DETROIT, MICH.
American Public Health Association. Annual meeting. Secretary, Homer N. Calver, 370 Seventh Avenue, New York, N. Y.

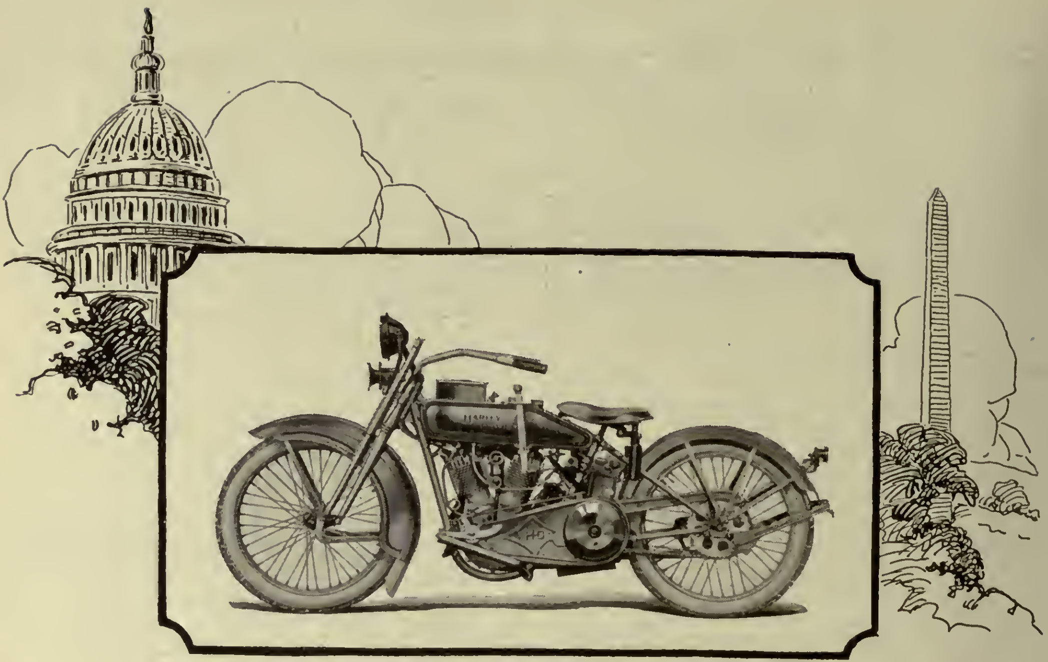
OCTOBER 27-31.—BRIARCLIFF MANOR, N. Y.
Illuminating Engineering Society. Annual convention. General Secretary, Samuel G. Hibben, 29 West 39th Street, New York, N. Y.

NOVEMBER 4-7.—HOUSTON, TEX.
Texas Association of Sanitarians. Annual Short School for Sanitarians, in cooperation with the Texas State Board of Health. Secretary, E. G. Eggert, Texas State Board of Health, Austin, Tex.

NOVEMBER 7-11.—COLUMBUS, OHIO.
American Country Life Association. Annual conference. Secretary, Henry Israel, Room 1849, Grand Central Terminal, New York, N. Y.

NOVEMBER 10-12.—CAMBRIDGE, MASS.
National Association of Civic Secretaries. Annual meeting. Secretary, Robert E. Tracy, 313 South Broad Street, Philadelphia, Pa.

NOVEMBER 10-12.—CAMBRIDGE, MASS.
National Municipal League. Annual meeting. Secretary, H. W. Dodds, 261 Broadway, New York, N. Y.



Uncle Sam's Motorcycle

ENDORSEMENT of the Harley-Davidson by many departments of the United States Government confirms the wisdom of 1682 cities, towns and states which use this famous motorcycle for police work.

U. S. Bureau of Immigration, Washington, D. C., just bought 29 Harley-Davidsons and 21 sidecars for border patrol duty.

U. S. Customs Service, St. Albans, Vt., just purchased 12 Harley-Davidsons for patrolling the international boundary.

U. S. Post Office Department recently bought 15 Harley-Davidsons and sidecars for service in Hawaii.

Many other Government departments have used Harley-Davidsons for years. And veterans will never forget the unfaltering service of this sturdy, dependable, economical motorcycle in the World War.

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News and Illustrations

Items of Interest to City, Town and County Officials, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Model of Asphalt Lake Displayed at Wembley

Visitors to the British Empire Exhibition being held at Wembley, England, have expressed considerable interest in the exhibit of Trinidad, a British possession in the Caribbean Sea, where the Trinidad asphalt lake is located. This model of the asphalt lake is one of the important features of Trinidad's exhibits. The model is constructed of balata gum except for the lake, which is made of native asphalt taken from the Trinidad asphalt lake.

In the reproduction of the photograph of the model below, in the lower right-hand corner will be seen the village of La Brea, while above at the edge of the lake is the village of New Jersey, where the laborers and their families live. The asphalt refinery and barreling plant are to the left of the village. The office of the Asphalt Company, bungalows of the employees of the Company, hotel and clubhouses are located between the refinery and the loading pier. At the extreme left-hand corner of the photograph is the jetty and end of the aerial tramway, where vessels dock to be loaded with asphalt.

Since 1888 approximately 4,500,000 tons of asphalt have been removed from the lake in Trinidad. The asphalt lake is operated on a lease from the British government by a subsidiary of the Barber Asphalt Company, Land Title Building, Philadelphia, Pa. The royalties and duties paid the government since 1888 have amounted to $7,100,000.

The origin of this asphalt lake is attributed to petroleum springs far beneath the surface of the lake. Scientists say that the pitch worked its way upwards centuries ago and came in contact with a huge mass of volcanic matter, the chief component of which is clay in a colloidal form, and the asphalt resulted. The depth of the lake is a mystery. In 1916 borings were made to ascertain the depth, but the drill which was sent down was bent and rendered useless by the movement of the asphalt at a depth of 175 feet, so that the actual depth of the lake is unknown.

The asphalt is dug from the lake by West Indian negroes by the use of broad-faced picks. The asphalt breaks in large chunks, weighing from 40 to 50 pounds, and is carried by natives to small cars and distributed on a narrow-gage railroad to the refinery near by or to the pier,

MODEL OF THE ISLAND OF TRINIDAD SHOWN AT WEMBLEY BRITISH EMPIRE EXPOSITION

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Policy---

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Hold One?

THE LEHMAN TRAFFIC GUIDE

may be called a life insurance policy for the protection of the public. The City (policy holder) purchases the Guide to insure its citizens (beneficiary) of absolute safety, thereby eliminating worry and preserving life by preventing traffic accidents.

To City Officials—It is your duty to see that your City has the best protection that money can buy. Insure your City with the Lehman Traffic Guide, a marker conspicuous by night or day that cannot be damaged by the heaviest loaded truck. The Lehman Traffic Guide is lighted by night by two bulbs which shine through ten 3½-inch ruby lenses. It stands but 5 inches high. It can be built to fit any size manhole, thus doing double duty as a traffic guide and manhole cover.

Don't Wait! Insurance tomorrow will not be of any assistance today in preventing some terrible accident.

ELKHART FOUNDRY & MACHINE CO.
SOUTH ELKHART AVENUE ELKHART, INDIANA

THIS PHOTOGRAPH, TAKEN JUNE 25, 1924, SHOWS JIMBOCHO, ONE OF THE RECENTLY REBUILT STREETS IN THE BURNED AREA OF TOKIO

Notwithstanding the fact that buildings were shaken to pieces, the only damage done to this street, which is paved with Trinidad Lake asphalt, was a few slight burns that resulted from the intense heat of the flames which followed the earthquake

and shipped to the United States and other countries. The railroad running over the surface of the lake is laid on palm-tree ties and because of the constant motion of the asphalt the tracks frequently become twisted and must be inspected and straightened at regular intervals. When a quantity of asphalt is dug from the lake the cavity fills up within a short time. It often occurs that the natives in a day's work will make an excavation of approximately 500 cubic feet. However, on their return to work in the morning they find that the hole has disappeared and the space that was excavated has filled to approximately the level of the rest of the lake. All traces of the hole disappear in a few days. At first it might seem as if this phenomenon might be due to new asphalt coming into the hole from some underground source, but geologists state that the excavation is filled by the very slow settling or levelling of the entire surface of the lake. During the last 36 years, 4,500,000 tons of asphalt have been removed from the Trinidad Asphalt Lake and the level of the lake has dropped several feet.

Because of the composition of the asphalt, it runs together in a compact mass after being placed in the hold of the ship, and by the time the vessel has reached its destination it is once more solid matter. When the vessel is to be unloaded, laborers once again have to dig it out of the hold just as it was originally dug from the lake. Crude asphalt contains about 29 per cent water and must be refined before it can be used for commercial purposes. This is a simple process in which the asphalt is placed in large rectangular vats fitted with coils of steam pipe. Steam is allowed to pass through the pipes, causing the asphalt to melt and the water to evaporate.

Asphalt from this lake was first used for street paving, but a short time after it began to be used for the manufacture of asphalt shingles and roll roofing. Thousands of tons of asphalt are used annually in the construction of built-up roofs and asphalt mastic floors for large office buildings and industrial plants. A large amount is also used in the waterproofing of large engineering projects such as tunnels, bridge structures, dams and reservoirs.

Extension of Street-Lighting Service by Welsbach Company

The Welsbach Street Lighting Company, Philadelphia, Pa., which for over 25 years specialized in gas street lighting, has announced that it will extend its services to include electric street lighting. Through cooperation with the principal electric industries and central stations, it will undertake the development and maintenance of the existing as well as the construction of the most modern street-lighting systems. The aim of the organization, which is national in scope, is to give municipalities the most efficient and economical street-lighting service possible.

The Company has secured the services of Walter C. Allen, formerly Electrical Engineer of the District of Columbia, who had charge of the street-lighting system in the District for over 22 years, and under whose direction most of the lighting in that city has been installed. Mr. Allen will have immediate charge of the new branch of the Welsbach Company's operations and will bring to his new duties his extended experience in this special line of work, as well as the added experience in municipal and public utility activities gained during the last eight years as executive officer of the Public Utilities Commission of the District of Columbia. Mr. Allen is a graduate in civil engineering of the University of California and is a member of the Illuminating Engineering Society and an associate member of the American Institute of Electrical Engineers.

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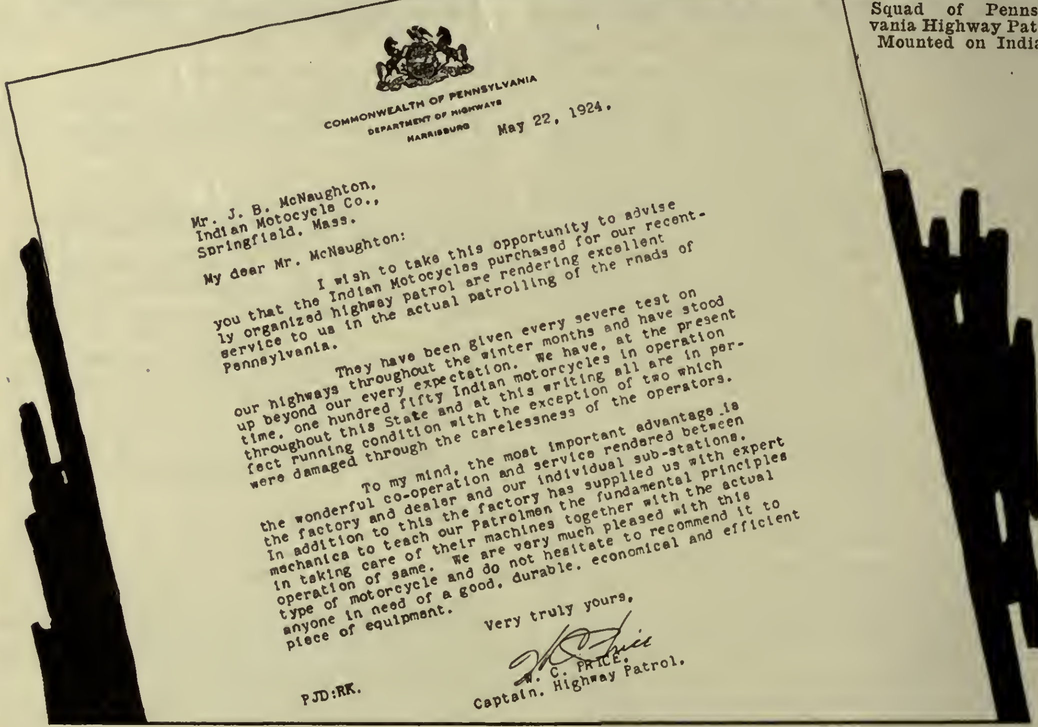
Pennsylvania Highways Guarded By—
150 *Indian Motocycles*

Squad of Pennsylvania Highway Patrol Mounted on Indians.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HIGHWAYS
HARRISBURG

May 22, 1924.

Mr. J. B. McNaughton,
Indian Motocycle Co.,
Springfield, Mass.

My dear Mr. McNaughton:

I wish to take this opportunity to advise you that the Indian Motocycles purchased for our recently organized highway patrol are rendering excellent service to us in the actual patrolling of the roads of Pennsylvania.

They have been given every severe test on our highways throughout the winter months and have stood up beyond our every expectation. We have, at the present time, one hundred fifty Indian motorcycles in operation throughout this State and at this writing all are in perfect running condition with the exception of two which were damaged through the carelessness of the operators.

To my mind, the most important advantage is the wonderful co-operation and service rendered between the factory and dealer and our individual sub-stations. In addition to this the factory has supplied us with expert mechanics to teach our Patrolmen the fundamental principles in taking care of their machines together with the actual operation of same. We are very much pleased with this type of motorcycle and do not hesitate to recommend it to anyone in need of a good, durable, economical and efficient piece of equipment.

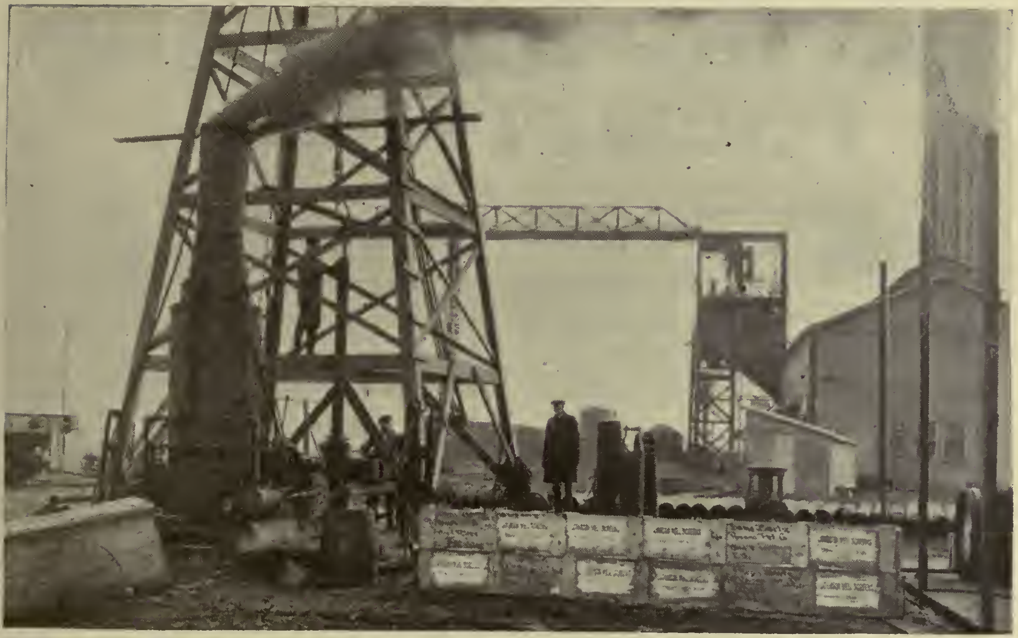
Very truly yours,
W. C. Price
W. C. PRICE,
Captain, Highway Patrol.

PJD:RK.

Besides Pennsylvania and many other states there are over 1000 cities and towns that use Indian Motocycles in maintaining law and order. And in nearly every case the Indian Scout is the favorite. It is ideal for patrol work, escort duty and for catching speeders and criminals. 100 pounds lighter than ordinary motorcycles yet powerful and sturdy. Goes 60-75 miles per gallon. Has left-hand throttle control. Write for our free booklet "Maintaining Law and Order."

Indian Motocycle Co.

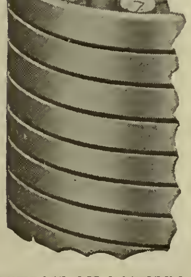
DEPT A-9 SPRINGFIELD, MASSACHUSETTS



INSTALLING A 15-INCH JOHNSON WELL SCREEN

Types of Wells

The dug well is the oldest form in use to-day. In fact, until very recent years the so-called "tube well" was unknown. As long as the dug well was the only thing known there was every reason for using it. A dug well is expensive, being many times as costly as a tube well, or wells, of the same capacity. This has frequently raised the proposition that a large-diameter well will yield a greater quantity than one of small diameter. This is true, but not in proportion to the increase in size and cost. It is easily seen that the cost of a dug well is out of all proportion to the value received. Not only is the expense of sinking an open well burdensome, but the excavation may cause the whole surrounding neighborhood to settle, owing to the removal of sand which cannot be replaced.



SECTION OF JOHNSON WELL SCREEN

To justify the recommendation of a dug well at the present time one must have a shallow water-bearing sand stratum and that lying within a few feet of the surface. Even problems of this kind are generally better solved by a battery of six-inch tube wells. The reason is logical and very obvious—a greatly increased drainage area is obtained. Fine sand is sometimes given as a reason for spending large sums of money on an open or dug well. For a fraction of the cost the tube well can be gravel-packed to give the same effect.

The tube well is by far the least expensive of all wells, because of its adaptability to all conditions. The material can be purchased in all markets, the local driller can install it, and it can be made in all sizes from 2 inches up. A screen with an inlet slot suitable to the sand may be installed after the well is sunk and the size of sand determined. The Johnson well screen, made by Edward E. Johnson, Inc., St. Paul, Minn., has, rather than many short and interrupted slots, one slot continuous from end to end of the tube. This intake slot runs spirally around the screen and is pitched 5½ to the inch. The manufacturers claim that this intake slot is 30 to 50 per cent longer than the sum total of the slots in other brass screens. This increased intake slot length per foot of screen naturally gives an increase in the amount of water admitted to the well, makes pumping easier and gives longer life to the well.

The sand protection of this screen is particularly good. One of the duties of a well screen is to keep the sand out of the well. This does not, however, mean all of the sand, because it is well at first to pump out all of the finest sand. A screen with a slot to hold back all of the sand about the well end from the time the well is first pumped would, in the majority of cases, make the well practically useless. The slot would be so narrow as to greatly impede the flow of water into the well. The screen must be made to admit a large percentage of the sand immediately surrounding the well end. The intake slot of the Johnson well screen is designed to allow this development with ease. Not only is the slot larger on the inside than on the outside, but no parts of the slot are parallel, a feature in the brass well screen field which is claimed to be absolutely unique in the Johnson well screen. All sand passing the lips of the slot can go without hindrance into the well and thence be pumped out, preventing rapid clogging of the well.

PAVING BRICK AND POCKETBOOKS

THE town, county or state that consistently paves with vitrified brick lightens the strain on every citizen's pocketbook for years to come.

A properly-designed, well-built vitrified brick pavement can be counted on for a quarter-century or more of service at a minimum of repair and upkeep cost. Many communities are enjoying brick pavements laid thirty and thirty-five years ago and look forward to getting fifty years of service before they need replacement!

Profit by the experience, for instance, of Bucyrus, O., where Walnut Street, a main traffic route, is still paved with the brick originally laid in 1891, 33 years ago, and relaid in 1922, *other side up,* for another generation of service. Or of Clinton, Iowa, which has yet to need a major repair for brick-paved Seventh Ave., between 2nd and 5th Sts., laid 32 years ago.

Do you know of any other pavement at a comparable cost which can hope to equal these records? Is there a pavement, *other than brick,* in *your* locality which can show any such record?

Be led by experience — advocate vitrified brick pavements and keep taxes down. Get the pavement that *outlasts the bonds.*

VITRIFIED Brick PAVEMENTS

National Paving Brick
Manufacturers Association
Engineers Bldg. Cleveland, O.

OUTLAST THE BONDS

A Factory-made Rail Filler

Municipal officials and street railway engineers have experienced a great deal of trouble from the vibration of street railway tracks, causing pulverization, resulting in voids which permit water to percolate and injure the structure. Cement, plaster, clay, tile and other similar brittle materials have been used as rail fillers without much success.

The Philip Carey Company, 54 Wayne Ave., Lockland, Cincinnati, Ohio, has developed the Carey Elastite rail filler, which is made to conform to the particular section of rail used. It is designed to give a complete vertical separation for the rail from top to bottom, so that it has no connection with the adjacent pavement, thus eliminating much of the pavement maintenance which has been so costly along street-car rails.

PLACING ELASTITE RAIL FILLER

The rail filler is an asphaltic compound furnished in strips from 3 to 5 feet long, which are fitted against the web of the rail by placing and light driving. The filler extends slightly beyond the head of the rail, serving as an expansion joint for the pavement. The joint is factory made, uniform in dimensions and area, and is delivered ready for use. The labor cost for installation is a minimum and there is practically no loss or waste of material. This rail filler, which is unaffected by moisture or temperature changes, is readily shaped on the job to fit any track curve.

Large Purchase of Playground Apparatus

The Board of Education of the city of St. Louis, Mo., has recently placed a very large order for playground apparatus. The order amounts to $25,000 and includes apparatus for equipping thirty-three of the St. Louis school yards, so that each child may enjoy his recess in his own particular way and receive physical benefit from his play.

R. M. Milligan, Commissioner of Schools, made a rigid examination of the equipment submitted by various manufacturers and then placed the order with the Everwear Manufacturing Company, Springfield, Ohio.

New Transmission for Ford Trucks

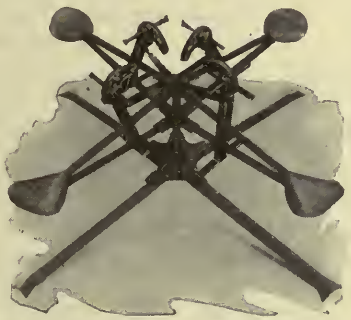
An auxiliary transmission for Ford 1-ton trucks has been developed by the Warford Corporation, 44 Whitehall Street, New York City. This transmission is a selective type gear shaft, which is installed directly behind the Ford transmission and makes no change in the original design or engineering features of the truck.

Chrome nickel gears are used in this transmission, mounted on vanadium steel shafts which revolve in tapered roller bearings adjustable for wear. The assembly is housed in a heavy cast aluminum case to protect it from dust. This transmission gives the Ford six speeds forward and three reverse, with gear ratios ranging from 36.54 to 1 in the first speed, to 5.31 in the sixth speed. This invention makes the Ford 1-ton truck more adaptable to municipal hauling, as it decreases maintenance costs, increases speed and increases the pulling power.

A New Amusement Device

The "Merry-Go-Bob" is a new recreational and amusement device which is a combination of the merry-go-round, teeter and rowing machine, all built into a single unit for children. This device is being sold by the W. H. Day Company, 131 Sixth Street, Milwaukee, Wis. The organizer of this company is W. H. Day, who was formerly advertising manager of the Gas Engine Works of the Worthington Pump & Machinery Corporation, Cudahy, Wis.

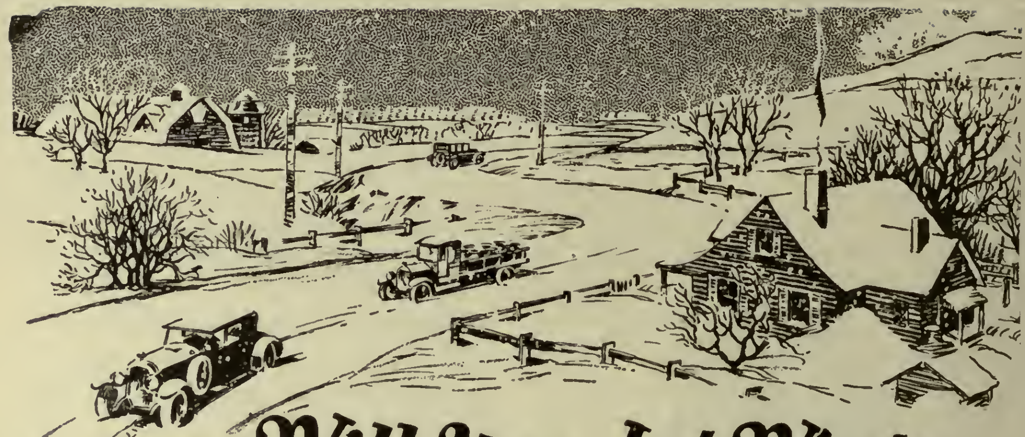
The 4-passenger size of the "Merry-Go-Bob" is shown in the accompanying illustration. This machine is also made for the use of two children. The device has shown itself to be popular in home play rooms and nurseries, on the porch or lawn, in schools, on playgrounds, in parks, camps, resorts, neighborhood centers, clubs, hotels and institutions. It provides healthful amusement and exercise for youngsters and is absolutely safe. It has no gears, chains or belts. Seated comfortably on the machine, the children, by alternately pushing with the feet and pulling with the hands, propel themselves in an inclined circular plane around an inclined axis, so that with each revolution each child rises and falls six inches.



A COMBINATION MERRY-GO-ROUND, TEETER AND ROWING MACHINE FOR PLAYGROUNDS

Additions to Gamewell Staff

The Gamewell Company, Newton Upper Falls, Mass., has anounced that R. G. McLaughlin and J. S. McGehee have been added to its sales staff. Mr. McLaughlin has been assigned to assist A. L. Tinker, District Sales Manager of the Middle Atlantic States. Mr. McGehee is assisting Charles Berst, District Sales Manager of the Southern States, with headquarters at Atlanta.



Will You Let Winter Wreck Your Roads?

WHAT about your roads next winter? This is a question calling for an immediate answer. If you intend putting your roads in the condition they should be in when winter comes, you will have to act promptly.

Every road engineer knows that roads suffer greatly in the winter, if they are not in condition to meet the severe tests which winter imposes. A weak point or hole which would have been a minor repair in the fall, will grow greatly during the winter. A dollar spent in maintenance now may forestall the necessity of spending two dollars on the same job in the spring—and the road will be in better condition throughout the winter.

At this season we particularly call attention to the advantages Standard Asphalt Road Oils have to offer and to the excellent roads which are being built by the penetration method.

At a comparatively small per mile cost you can put your roads in excellent condition to go through the winter. On the other hand, if you neglect your roads now, they may be damaged to the extent of thousands of dollars before spring.

This is a subject to which the engineers in our asphalt department have devoted much study. They will gladly co-operate with you and their recommendations will be based on years of practical experience, as a result you will be certain of deriving the greatest amount of benefit possible from the money expended.

Ask for this free booklet.

Their services, which are free, are always available to you. Wire or phone us today.

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WISCONSIN
La Crosse
Milwaukee

MINNESOTA
Duluth
Mankato
Minneapolis

MISSOURI
Kansas City
St. Joseph
St. Louis

THE CLEVELAND AUDITORIUM EQUIPPED WITH SLIP-PROOF RAMPS AND FLOORS

Safety Treads in an Auditorium

It is claimed that the great auditorium of Cleveland, Ohio, where the Republican National Convention was held in June, can be emptied in five minutes or less. This is due chiefly to four main ramps, running from the first to the third floor, and a ramp from the basement to the first or main floor. The selection of a floor material for these ramps was an architectural problem which was solved for this great municipal building by the use of 55,000 pieces of Norton Alundum tile, made by the Norton Company, Worcester, Mass. In this case, slip-proof effectiveness in a walking surface insured a maximum degree of safety to the public and was considered of first importance.

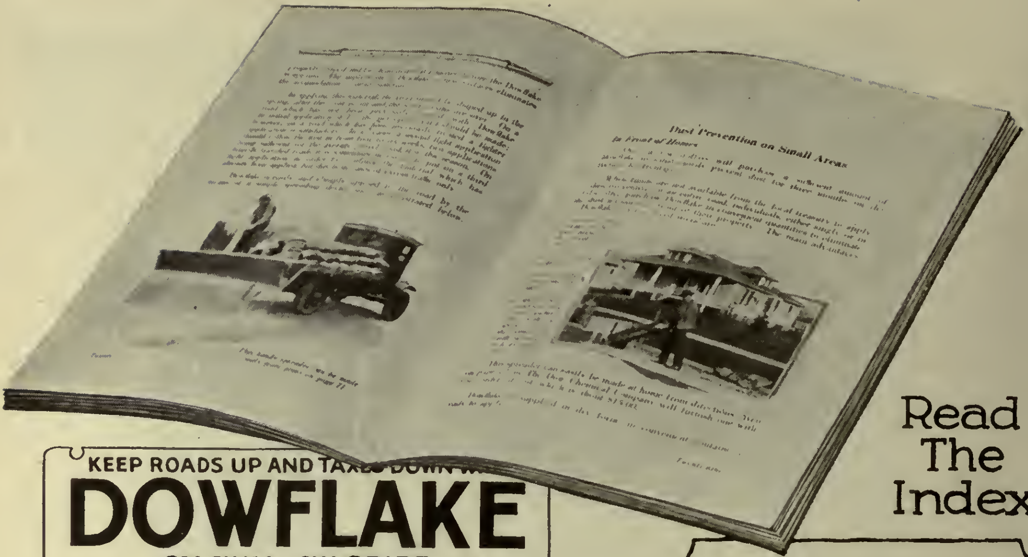
This type of Norton floor, a semi-vitreous tile, is made by mixing the electric furnace abrasive known by the trademark "Alundum" with a clay bonding material and vitrifying in a kiln by the same process used in the manufacture of Norton grinding wheels. This material has many definite needs in places such as the Cleveland auditorium, for stairway and railway station stairs and platforms, ramps and stairways in industrial buildings, and similar places where foot traffic is heavy and where there is a slipping hazard. In emphasizing the non-slip walking surface, the feature of durability should not be overlooked. To all who are acquainted with modern machining methods in the metal industries there is no need of emphasizing the toughness or the non-wearing properties of Alundum abrasive. It is doubtful if there are any materials that have had as severe tests in wear. In the metal industry throughout the world, this remarkable electric furnace product has been largely instrumental in revolutionizing machining methods. It is evident, therefore, that the wear from foot traffic will have very little, if any, effect on this vitrified tile.

Westinghouse Purchases Massey Concrete's Pole Business

The Massey Concrete Products Corporation, Peoples Gas Building, Chicago, Ill., has sold to the Westinghouse Electric & Manufacturing Co. its entire interest in the manufacture and sale of Hollowspun reinforced concrete street-lighting standards and concrete poles for street railway service, including its plant at Milwaukee, Wis. Since the Hollowspun department was confined exclusively to the Milwaukee plant of the Massey Corporation, its sale in no way affects the activities of the Massey Company in its other twelve plants where reinforced concrete pipe, piles, cribbing, signal material and other similar products for railroads and industries are manufactured.

For a number of years, the Westinghouse Electric & Manufacturing Co., through connections and relations with the George Cutter Company, has been engaged in the manufacture of cast iron poles for industrial, ornamental and street-lighting purposes at the George Cutter Works, South Bend, Indiana. The addition of the Hollowspun line to the line formerly manufactured increases the variety of poles which may be offered by this company to cities for street-lighting purposes. Hollowspun lighting standards which are made by the centrifugal process demonstrate the possibilities of efficiently moulding concrete. The great force with which the concrete is tamped in the mould and around the reinforcement by the centrifugal process insures a uniform strength and surface texture throughout the length of the product.

The transfer of the Massey plant became effective July 1, and the Westinghouse Company will handle the Hollowspun business through the George Cutter Works.



Read The Index

KEEP ROADS UP AND TAXES DOWN

DOWFLAKE

CALCIUM CHLORIDE

A Book for Road Men "How to Maintain Roads"

New and enlarged edition.

This pocket-size volume is chock full of valuable data and information no road man can afford to miss. It tells the latest methods being used by your fellow road builders, with complete information on what they do and how they do it, with quantities of materials to use, and tables, charts and diagrams which show the results of road building and maintenance experience over a period of years and under widely varying conditions. It is really a tribute to the thought, energy and skill of road men throughout the country for it is their work which has made this book possible. It treats of every day problems a road man encounters and is really a summary of accepted methods practiced by the foremost engineers and maintenance men. It's your own book—send for it today and see what your fellow-workers are doing.

The Dow Chemical Company
Midland, Michigan

BRANCH SALES OFFICES

90 West Street
New York City

Second & Madison Sts.
Saint Louis

This Is Only a Part of the Contents of This Book—It Will Give You an Idea of Its Wide Scope

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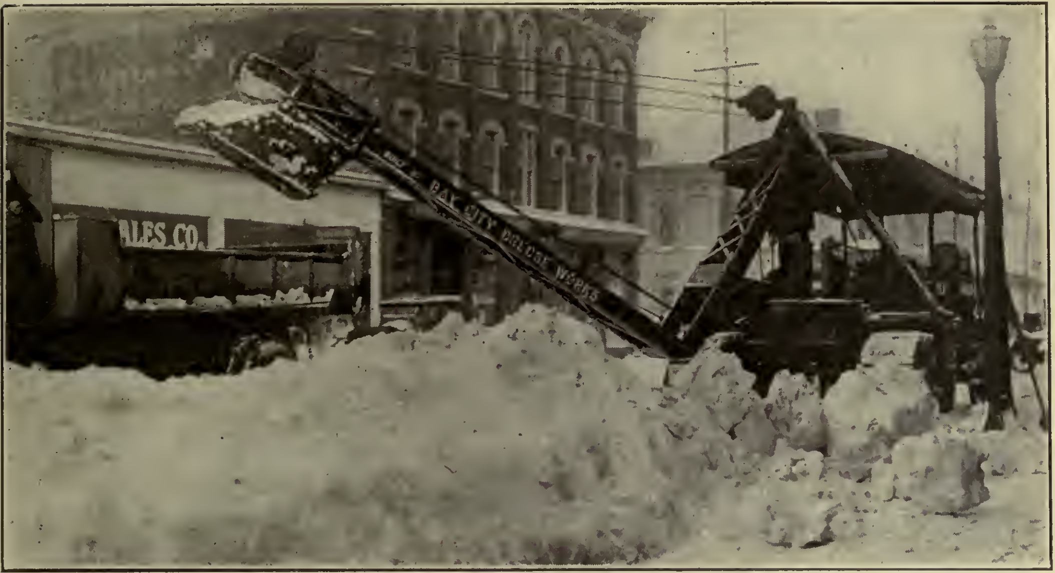


A CRANE EXCAVATOR WITH SKIMMER SCOOP REMOVING SNOW AFTER A FOUR-DAY STORM LAST WINTER IN BAY CITY, MICH.

Clearing Up City Streets After Heavy Snow Storms

Last winter a four-day snow fall in Bay City, Mich., was accompanied by high winds, causing bad drifts in the down-town district, so that it was impossible to park or operate automobiles. The Street Department, with trucks and hand shovels, was not able to keep ahead of the snow storm. The Bay City Dredge Works came to the rescue by loaning a Model 16-B crane-excavator with skimmer scoop to the Street Department. Although this excavator was equipped with only a ⅝-cubic yard capacity bucket, it was able to load trucks at the rate of 8 cubic yards in five minutes. Five-yard trucks were piled up with about 8 cubic yards of snow, and the excavator was kept busy until midnight, operating 15 hours per day, and in two days the cleaning up of more than 11 city blocks was completed.

The ⅝-cubic yard capacity skimmer scoop is intended normally for work in very hard material, such as hard clay, stone road or old pavement work. A 2-cubic yard capacity snow bucket could have been handled with ease on this excavator, enabling the machine to load a truck in two trips or in less than one minute's time.

Cities and counties handling their own paving and road work and using a machine of this sort for grading, find it advantageous to use it in snow removal during the winter months. The skimmer scoop with its long horizontal crowd, cleans the snow from the pavement without any injury to it. The machine operating in Bay City and described above handled as much material as it would have been possible to remove with 20 men.

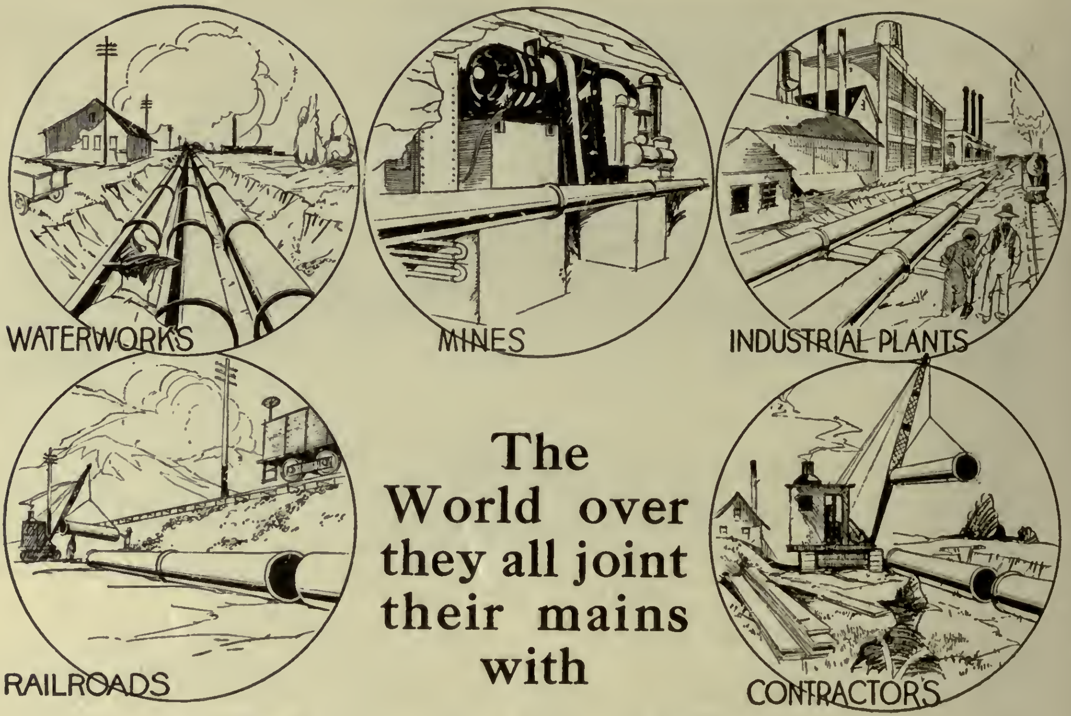
New Field Engineers for Asphalt Association

The Asphalt Association, 25 West 43rd Street, New York City, has announced several changes in its field personnel and the consolidation of the Newark, N. J., branch office with the main office in New York City. Vibert L. Ostrander, formerly First Deputy Commissioner, New York State Highway Department, has become manager of the Eastern District of the Association, with headquarters at 25 North Pearl Street, Albany, N. Y., succeeding Germain P. Graham, who has resigned to enter private practice. Frederick A. Reimer has resigned as manager of the New Jersey District to enter private business, and W. C. Ricketts has succeeded Harry P. Grier as a field representative in the Southern District, with headquarters at Charlotte, N. C. W. A. Crossland has accepted a position with the Southern branch. Frederick C. Field, until recently with the City Engineering Department at Calgary, Canada, has been appointed field representative in Canada, and will travel from the main office in New York City.

Columbian Iron Works Acquires New Plant Site

The Columbian Iron Works, Chattanooga, Tenn., has announced that it has purchased the property owned by the Continental Machinery Company in Chattanooga. Several weeks ago the capitalization of the Columbian Iron Works was increased and at that time it was explained that the increase was to take care of future expansions that would be made necessary by the increase in business of the iron works. The entire Columbian plant is to be moved from from its present location to the property purchased, which is located at Missionary Avenue and the Central of Georgia Railway. There will be no immediate developments and it is indicated that about three or four years will be required before the Columbian plant is entirely moved, as one department at a time will take up its location in the new building as prepared.

A large plant has been made necessary by the rapidly growing business of the Columbian company. The company now manufactures about 70 per cent of all the standard Underwriters Laboratory approved sprinklers and fire-hydrants and valves. The plant is the only one of its kind in the South and it is known over the entire country.



The
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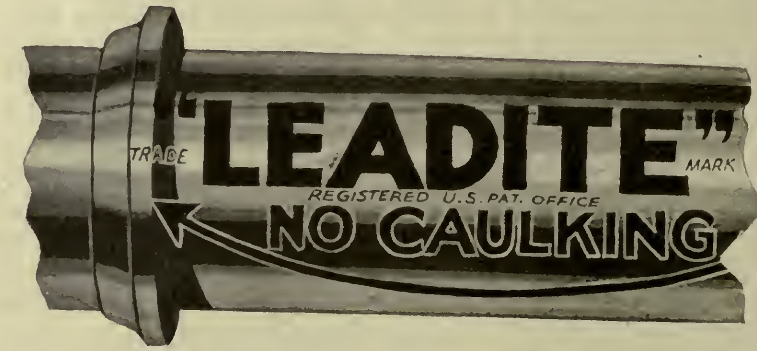


HUNDREDS of Water Works, Railroads, Mines, Contractors, and Industrial Plants have installed thousands of miles of cast iron bell and spigot water mains with LEADITE Joints.

They have used LEADITE on all sizes of pipe from 4-in. to 60-in., and under all pressures and conditions—under paved streets, under railroad tracks, over bridges, through rough and smooth country, and they are all enthusiastic with the good results secured, and the savings effected.

LEADITE saves at least 50% to 75%.

One contractor laid 1,665 feet of 6-in. pipe with LEADITE in 7½ hours with a gang of six men.

LEADITE Joints improve with age.

Leadite is the Pioneer Self-Caulking Substitute for Pig Lead
Be Sure It Is LEADITE and Accept No Imitations

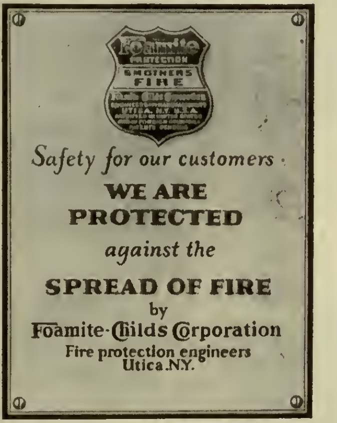
THE LEADITE COMPANY, Inc.

100 So. Broad Street **Philadelphia, Pa., U. S. A.**

Fire Protection at Filling Stations

Filling stations are always a source of fire danger, because at any point where gasoline is transferred from one storage tank to another or from a storage tank to a car, there is always the possibility that something may occur which will ignite the vapors and cause an explosion. The Foamite-Childs Corporation, 82 Turner Street, Utica, N. Y., is now furnishing the sign reproduced below, to all filling stations which are equipped with Foamite equipment to prevent the spread of fire. Where this sign is displayed, customers and neighbors know that their property is protected against serious fire at all times and that the filling station or garage is made as safe from fire as it can be.

Over fifty-three million barrels of oil and gasoline in great storage-tanks are now protected from fire by the Foamite method of smothering fire under Firefoam. It is claimed that this method has never failed when properly installed and operated. Foamite equipment includes the 2½-gallon Model CA Foamite hand extinguisher, which generates about 20 gallons of Firefoam, throwing it over a distance of 35 feet. One or more extinguishers of this model will adequately safeguard the average filling station. The 40-gallon Foamite engine on wheels generates about 300 gallons of Firefoam, reaching fire as far as 75 feet away. This is the protection recommended for large garages and filling stations where considerable quantities of gasoline and oil are stored. Municipal officials will do well to see that filling stations throughout their cities are properly protected, thus reducing the fire hazard at these danger points.

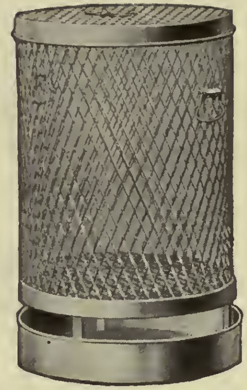


SIGNS LIKE THIS MEAN A LESSENING OF FIRE HAZARDS

A Rubbish and Trash Burner

Municipal galvanized ware of any type is more than a purchase—it is an investment. Therefore, only such material as is durable and able to stand rough usage should be purchased. Canco rubbish burners made by the American Can Company, Galvanized Ware Department, Toledo, Ohio, are durable and make an excellent piece of equipment for parks, cemeteries and similar places where rubbish accumulates and must be disposed of. The bodies are made of one piece of No. 12 gage open-hearth sheet steel, and their construction is such as to withstand heat and wear for a good period of time. The manufacturers claim that this burner will not warp from the heat. All the joints are welded and there are no rivets to loosen. There is no soldering on any of the parts, and after being made up, the whole burner is heavily galvanized.

This rubbish burner is also furnished with a detachable pan, which collects the ashes and prevents them from scattering around when the rubbish is being disposed of. The rubbish burner is made in two sizes, 15 x 26 inches and 18 x 30 inches, weighing 24 and 35 pounds respectively.



A SUBSTANTIAL RUBBISH BURNER

Lot Markers and Signs

Signs which instruct wanderers in parks to keep off the grass, or which are used to indicate the division lines of lots in cemeteries, or for property, should be neat and permanent. The W-C line of hot galvanized cast iron lot markers and signs, made by Wilcox, Crittenden & Co., Inc., Middletown, Conn., are clean-cut, clearly-read markers with a high degree of permanency. They are made of hot galvanized cast iron, cast in one piece so that they are practically indestructible.

A PERMANENT SIGN THAT IS EASILY READ

MUSHROOM
Reg. U.S. Pat. Off.
Traffic Lights

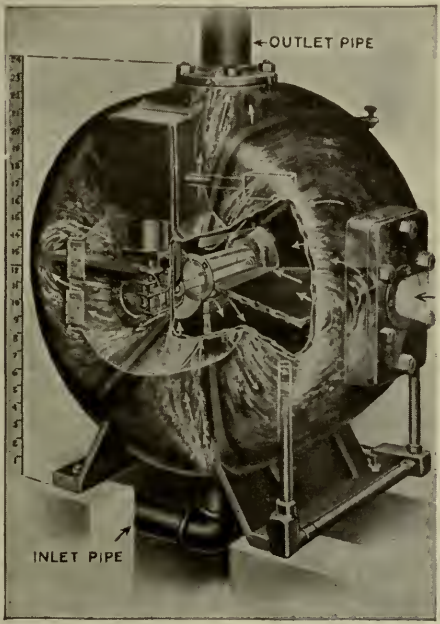
ESSCO MFG. CO.
PEORIA, ILLINOIS

The Sterilization of Water in Swimming Pools by Ultra Violet Rays

The sterilization of swimming pools by means of ultra violet rays in connection with recirculating filtration systems has been developed by the R.U.V. Company, Inc., 383 Madison Avenue, New York City. The recirculating system is used where a sufficient stream of fresh, pure, wholesome water fit to drink is not available to be added to a swimming pool continuously and involves the use of filtration and sterilization, to keep the water in a strictly sanitary condition.

The recirculating system as installed by this company is composed of a pump, filter and ultra violet ray sterilizer, to which a heater is added where the temperature must be controlled. The pump provides the means of having a constantly inflowing stream of water. The sand filter provides a means of keeping the water clean and colorless and helps to increase the efficiency of the ultra violet ray sterilizer, which provides a positive means of destroying harmful bacteria in clear water without changing the taste, odor or temperature of the water, and without adding any chemical disinfectant. This gives as a final product a water from which all impurities have been removed and the bacteria killed and to which nothing has been added

Generally speaking, any pool using the recirculating system should have a pump with a capacity at least sufficient to turn over the entire pool contents in twelve hours' time. Any slower rate will not give sufficient velocity in the pool body to keep smaller particles in suspension and allow the filter and recirculating system to do its work properly. For a 50,000-gallon pool an R.U.V. ultra violet ray recirculating system has a capacity of 5,000 gallons per hour. This gives a ten-hour turnover.



PHANTOM VIEW OF A SINGLE-LAMP ULTRA VIOLET RAY STERILIZER

Ultra violet rays are produced artificially by means of electricity through the use of the quartz mercury vapor lamp. The lamp consists of a straight quartz tube, with a bowl at one end, partially filled with pure mercury. The air is then pumped from the quartz container, producing a good vacuum. Tungsten electric terminals are sealed in the ends of the lamp. The mercury vapor arc which gives off ultra violet rays is produced in the lamp by first passing direct current electricity through the mercury and then separating the mercury from the positive electric terminal. This causes the electric current to jump from the terminal to the mercury through mercury vapor. The arc in mercury vapor produces powerful ultra violet rays. In the R.U.V. sterilizer the vapor arc is started automatically when the electric switch controlling the lamp is thrown in. This is accomplished through the use of a simple magnet tilting device which is attached to one end of the sterilizer and supports one end of the lamp.

To efficiently use ultra violet rays for the sterilization of water, a flume or water container is cast out of brass and is so arranged and designed that a quartz lamp can be passed through the center. This lamp is protected from contact with the water by use of a quartz tube which is packed in the flume to withstand the water pressure. Baffles are arranged in the flume so as to agitate the water as it passes through the field of ultra violet rays. This design makes it positive that all bacteria will come in contact with the destructive rays and thus eliminates any possibility of deadly germs reaching the outlet. The stirring action of the water in passing around the baffles makes it impossible for bacteria to remain in a shadow which might be caused by particles in the water.

New De Laval Representatives

The De Laval Steam Turbine Company, Trenton, N. J., has announced that The Wm. Constable Company, Providence Bldg., Duluth, Minn., will henceforth represent it in northern Minnesota, northern Wisconsin, and the northern peninsula of Michigan.

G. C. Kahl, 404 Dwight Bldg., Kansas City, Mo., has been appointed sales representative in Arkansas, Nebraska, Kansas and Oklahoma, Iowa east of the north and south line through Des Moines, but not including Des Moines, and Missouri west of and including Jefferson City.

A Reflecting Traffic Control Device

The Traffic Reflection "Frog," manufactured by the Temple Signal Company, Box 1671, 522 Moss Ave., Indianapolis, Ind., is a heavy casting of pleasing design, large enough to be readily seen yet small enough to allow the safe passage of any automobile which finds it necessary for its own safety to ride over the device. The illuminating elements, which are reflectors, using the light from the automobile headlights, are so constructed that they are visible to the automobile driver only and are not faded by overhead street lights. Automobiles having sufficient light for their own safety and the safety of others have no trouble in distinctly seeing the red light at a safe distance.

The reflecting elements are fitted into the casting in a manner which requires only a moment. The hazard of breaking is taken care of by the

A reproduction of No. 18 of the Graham Brothers Series on "American Industries", as published in the Saturday Evening Post of August 9, 1924

For the Public Good

The wealthiest institution in the world is the United States, with assets of one hundred and fifty billion dollars.

The safety of these enormous resources is dependent largely on the 770,000 officials and employes who administer our national, state, county and municipal governments. Often criticised, seldom commended, the great majority of these employes conduct public affairs in a capable, business-like manner, at salaries far below those paid by private corporations.

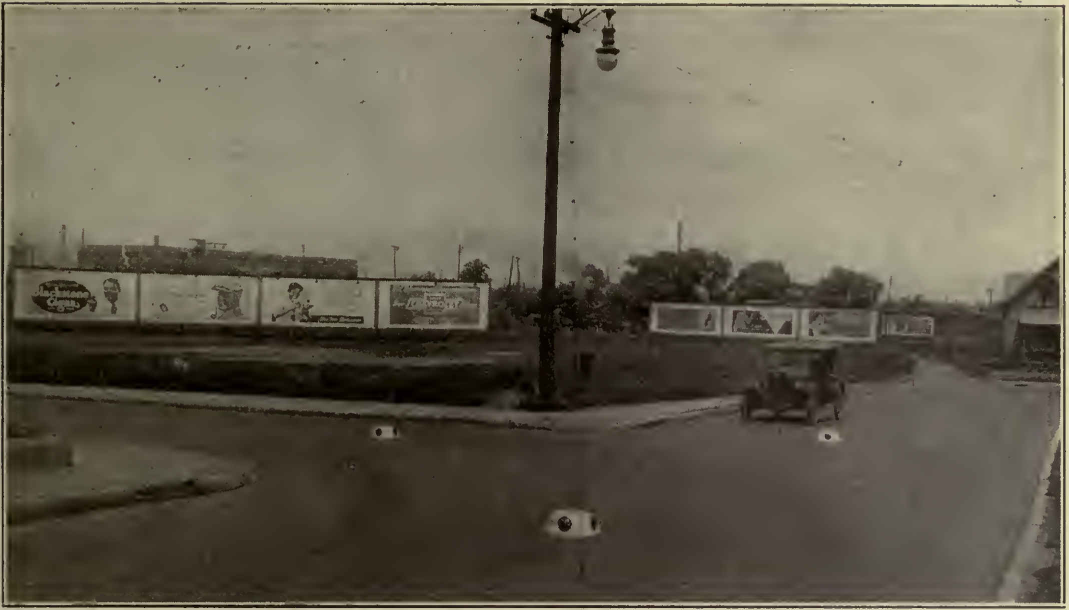
The selection of transportation equipment, particularly, affords public officials an opportunity to display good business judgment. And the constantly growing number of Graham Brothers Trucks in all branches of federal, state, county and municipal service, indicates that these officials are usually as insistent as any private buyer on better performance at lower cost.

The Federal Government, many states and counties and 185 municipalities own Graham Brothers Trucks—and find them eminently suited to the rigid requirements of public service.

1 Ton Chassis, $1265; 1½ Ton, $1315; f. o. b. Detr

GRAHAM BROTHERS
Detroit

GRAHAM BROTHERS TRUCKS
SOLD BY DODGE BROTHERS DEALERS EVERYWHERE



THREE REFLECTING TRAFFIC CONTROL DEVICES INSTALLED AT THREE-WAY CROSSING TO PREVENT CUTTING CORNERS

shape of the casting and the element is further protected by a spring at its back, so that should the element be struck, it would be pushed back into the casting and then rebound into place.

This unit, the first cost of which is its only cost, as it does not require electric current or the replacement of lamps, makes this traffic control device desirable for emergencies in large and small cities and towns. It is also readily used as a marker for safety aisles and zones, as well as to indicate the proper part for traffic to take in negotiating any corner.

A Successful Light-Weight Snow Guard

Highway officials are quite familiar with the snow fences used on open highways to effect a lull in the gale which is carrying snow, causing the snow to be deposited near the fence instead of drifting on to the highway. These fences are ordinarily rather bulky affairs and take up considerable space. The Wickwire Spencer Steel Corporation, 41 East 42nd Street, New York City, has developed a snow guard to take the place of the former bulky snow fence. This guard is a combination of hexagonal netting and wooden lattice strips, delivered in rolls of 50 linear feet. It has been subjected to the most rigid tests and found to fulfil its function of keeping roadways clear in heavy snows much more efficiently than the old fashioned, cumbersome wood snow guards. Its use reduces to a minimum the labor cost of erecting a snow guard in the fall and removing it in the spring, because it can be easily handled. It is so designed and constructed that it can be put in place on either level or uneven ground by two unskilled laborers.

The snow guard is 5 feet 6 inches high, and a 50-foot length when rolled is 30 inches in diameter. Each roll contains 11 steel posts, ¾-inch round, and made to extend into the ground a depth of 18 inches. They are sharply pointed to permit their being easily driven into frozen ground. The hexagonal netting is 3- by 6-inch mesh, No. 15 gage wire, and is heavily galvanized. In this mesh are interwoven ⅜ by ¾-inch lattice strips, spaced 4 inches on centers, leaving a space of 2 inches. Anchor pins, ¾-inch in diameter and 24 inches long, and guy wires made of No. 14 gage steel, each 72 inches long, are provided to anchor the snow guard at the position of each steel post and at the ends. The combination of steel posts and anchors will hold this snow guard in place against the strongest gale. The guard is approximately 50 per cent opening, allowing the eddying of winds, which causes the snow to pile up where it will not interfere with traffic.

Before placing this product on the market exhaustive tests were made by the engineers of the Wickwire Spencer Steel Corporation and the snow guard was placed in position along roadways where snow drifts are abnormally heavy. The heavy fall of snow during the latter part of the winter of 1924 indicated in these various positions the reliability of the product. Examination of the snow guard in the spring showed it to be in practically the same alignment as in the fall and unbroken in every respect.

THE FUN FUL LINE
PLAYGROUND EQUIPMENT

THE FASCINATION OF A SWING—

as *old* as the human race, but ever
new to each generation of children.

Vol. XXXI
No. 4

The American City Magazine

OCTOBER
1924

443 Fourth Ave.
NEW YORK

50 Cents
$4 a Year

A Code of Morals for Use in the Schools of America

A fine piece of public service is being rendered by "Collier's" in inviting suggestions for a Code of Morals suitable for use in the schools throughout the United States. As a contribution towards this discussion, THE AMERICAN CITY *suggests the form of pledge printed below; this to be made available in placard form for the walls of the school and the home, and to be supplemented by readings on the twenty-one points in a text-book to be compiled from the greatest recorded thoughts of all time, by a group of outstanding leaders of the religious, civic, and educational life of America.*

That I May Live an Upright, Useful and Happy Life

I will endeavor, to the best of my ability:

1.—To serve God and humanity with my heart and mind and strength;

2.—To honor my parents, and to be a credit to them at all times;

3.—To be a good citizen of my town, my state, my nation, and of the world;

4.—To seek for others, and not merely for myself, a happier and more abundant life;

5.—To be kind, courteous and unselfish;

6.—To be sympathetic with those who suffer, and more tolerant of the faults of others than of my own;

7.—To be clean, strong and alert, in mind and in body;

8.—To be honest, truthful and dependable;

9.—To be ambitious, but not envious;

10.—To be cheerful and hopeful, in thought and demeanor;

11.—To be self-reliant and courageous, but not vain or foolhardy;

12.—To control my tongue, my temper, and my appetites;

13.—To play fair in all the games and relationships of life;

14.—To help, by word and deed, the cause of peace and good-will among the nations of the world;

15.—To discover and uphold spiritual truth;

16.—To learn to know and enjoy the beauties of nature, of art and literature, and of human comradeship;

17.—To forego comfort or pleasure, when that shall be necessary, but not to be embittered;

18.—To fit myself for a congenial occupation whereby I may produce more that is of value to mankind than I consume;

19.—To use my time profitably, and my intelligence constructively;

20.—To seek frequent opportunities, through reading, contemplation or worship, to renew and increase my zeal for the finer things of life;

21.—To leave the world a better place for my having lived in it.

Requiring Owners or Tenants to Help in Fire Protection

TO provide the maximum of service by the city to its citizens without undue weakening of individual initiative and responsibility, is an ideal requiring constant study by every municipal government. A case in point is the problem of personal liability for fire protection in its relation to the increasing efficiency of municipal fire departments.

With the knowledge that a well-manned fire-fighting force with modern equipment can be summoned promptly by fire-alarm box or telephone, and that possible fire losses are largely covered by his insurance policies, the average citizen is apt to take an all too complacent attitude towards his responsibility in protecting his home or place of business from fire. If his complacency ever permits him to think about it at all, the citizen realizes that for an incipient blaze a fire extinguisher on the spot outclasses an engine at the fire house. He may even intend—when he gets around to it—to install some hand extinguishers in his home or place of business. But unless a local ordinance requires that this be done, his good intentions will usually extinguish themselves—and nothing else.

In any ordinance for the installation of fire extinguishers by owners or tenants, several factors need careful consideration. The ordinance should avoid specifying a particular make of extinguisher, and at the same time it should be drawn with the fact in mind that the purchaser will be apt to buy the cheapest extinguisher that he can find which answers to the legal requirement. It is not enough to specify that the extinguisher must be of a type approved by the Underwriters' Laboratories; the ordinance must recognize the fact that the Underwriters' Laboratories have differentiated very clearly between the several types of extinguishers as to their suitability for different kinds of fires, and that property owners must be protected against their own indifference to or ignorance of the technical points of fire protection engineering. The ordinary citizen can hardly be expected, for example, to understand the difference in efficiency and use between the various approved types of extinguishers, such as the soda-acid, foam, carbon tetrachloride and the calcium chloride types.

In addition to types of extinguishers, the ordinance, if properly drawn, will give consideration to the matter of size and to the number to be installed. While the 2½-gallon extinguisher is standard for factories and business buildings, a smaller size may be more practical for use in homes, schools or in any building where women and children are expected to operate extinguishers.

Other factors needing careful consideration include the proper hanging of the extinguishers, protection against freezing (or the use of non-freezing types), periodic cleaning and recharging, and instruction in their use. Simple though the operation of a fire extinguisher may be, the time to learn how to use the device is before the fire starts. Here, unquestionably, adequate preparedness is the price of safety.

Spread of the Two-Platoon Basis in Fire Departments—Cause and Effect

THE great demand for labor, with its increased pay and shorter working time, has resulted in practically all the larger cities and a great number of the smaller ones placing their fire departments on a two-platoon basis, with consequent increases in salaries. The influx of new men brought about by this change, and by vacancies caused by resignations, resulted in impairing rather seriously the efficiency of many fire departments. This has been recognized in most of the large cities, with the result that extensive systems of drills have been inaugurated, with adequately equipped drill towers.

A marked improvement along this line has been observed in a number of cities during the past year. The effect of military discipline and training on many of the young men in the fire departments is also noticeable. There are still some of the larger cities which have not adopted this modern method of drills and training, with the result that their departments are noticeably inefficient.

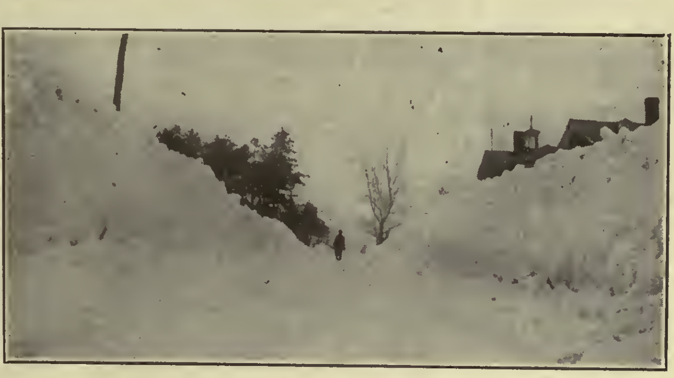
Another result of the adoption of the two-platoon system and the increase in salaries to hold the men, is the approximate doubling of the per capita maintenance cost. In some of the Western and Mid-Western States, notably Ohio, it has been impossible to establish a tax levy sufficient to maintain the fire department at this high per capita cost. This has resulted, in some cases, in materially decreasing the number of companies, or men assigned to the companies, with a corresponding decrease in the effectiveness of the department. The substitution of motor apparatus for horse-drawn has somewhat offset this condition. Doubtless there will be a tendency in the next few years to economize in municipal expenditures and this economy will probably include fire department operations. The two-platoon feature of organization, with the off-shift men subject to call, to a certain extent offsets the effect of a reduction in the force normally on duty.

—*Safeguarding America Against Fire*, July, 1924.

Snow Removal Methods in Manchester

By H. S. R. McCurdy

Surveyor, Department of Highways, Manchester, N. H.



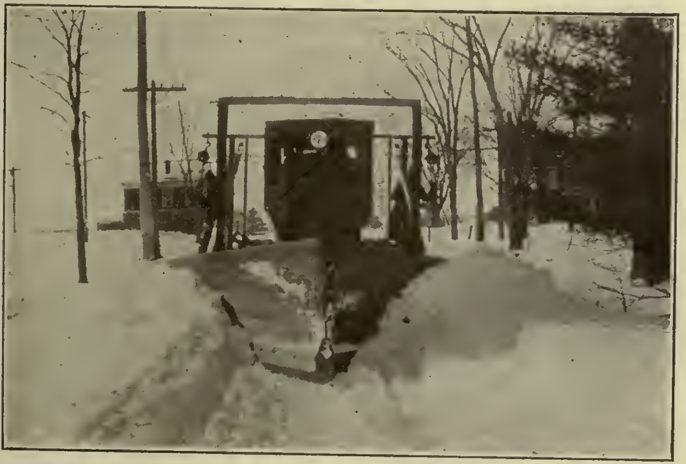
A STREET IN MANCHESTER, N. H., AFTER PLOWING BY HEAVY TRACTOR PLOW

NORTHERN New England is subject to snowfall conditions probably as severe as those in any part of this country. The storms are heavy and of frequent occurrence and the industrial nature of the communities renders any interference with traffic on the highways a serious and costly matter. In common with most other progressive cities, the traffic of Manchester is very largely motorized. The fire department is entirely so; and while some of the coal, wood and ice companies still use sleighs to a limited extent, this is principally owing to the fact that some of their hauling must be done in the rural sections.

The theory is frequently advanced by those who desire to use runners that it is a practicable matter to leave some snow on the streets—that the streets can be plowed or scraped or cleaned in such a manner that a smooth surface is left for both sleighs and motors. This is not so. While a street so treated may be used for a limited time in cold weather by motor traffic, the action of the tire chains soon forms deep ruts, which are extremely dangerous. In fact, there have been ruts so deep on the streets of this city that cars were forced to go blocks beyond their street before being able to turn out. Furthermore, when such ruts extend through to the street surface the concentrated wear on the pavement is extremely destructive.

In view of all the circumstances affecting travel on the highways it is the policy in Manchester to keep the streets thoroughly clear of snow. This work comes under the Highway Department. City forces are used exclusively, except for the sidewalk plowing and in the case of a few teams used at odd times and places to cart off snow.

For snow removal from the streets three types of plows are used. The largest and most powerful unit is the Sargent tractor plow attached to a 10-ton Holt Caterpillar tractor. The combined outfit was purchased in February, 1923. The Sargent plow and Holt tractor are used for the heaviest work and for the hill streets. Traveling at the rate of about five miles per hour, the outfit will clear a maximum width of 28 feet and to date has not encountered any work too severe to handle. To secure adequate traction, however, it is necessary to equip the tractor with military grousers, which are nothing more nor less than cast iron cleats bolted to the treads.



SARGENT PLOW AND HOLT TRACTOR CLEANING SIDE STREET IN MANCHESTER, N. H.

The crew for the tractor plow consists of a driver for the tractor and two men to operate the wings of the plow, the labor cost, at the rates paid in Manchester, amounting to $1.50 per hour. The outfit has gone through practically two winters with only nominal repairs.

For the more level streets four Champion blade plows are used. These plows are attached to the front of five-ton motor trucks and are extremely efficient for ordinary snowfalls on roads which are not too steep.

The third type of plow used is the Sargent truck plow, a V-shaped plow for use with motor trucks. This plow is of wooden construction and was found to be not quite stout enough for the work it was called upon to do. As a result, it was out of commission a considerable portion of the time and required considerable repairs. This company now puts out a stronger model of this plow which should be a marked improvement.

It is the policy of the Highway Department to get the jump on the snowstorms, and as soon as from 4 to 6 inches of snow has fallen the equipment is sent out. The blade plows are routed through the principal thoroughfares pushing the snow over into the gutters, making as many runs as are necessary to do this, depending upon the width of the street. The length of the blade is 10 feet, clearing a swath about 8 feet wide, depending somewhat upon the angle at which the blade is set. The plows are followed by small gangs of shovelers whose duty it is to open up the crosswalks where the plow furrow has crossed an intersection.

The tractor plow confines its operations chiefly to the steeper grades and to the trunk line highways leading out of the town. The city of Manchester covers an area of 34 square miles, with a population of about 80,000, and, as a result, there are many miles of more or less important thoroughfares in the sparsely-settled outlying districts. For these the tractor outfit is particularly adapted, as it possesses the power necessary to buck the drifts and can cover ground on practically any kind of roadway.

The Sargent truck plow is used principally on the residential streets where one run is sufficient, opening a road from 6 to 12 feet wide, depending upon the adjustment of the wings.

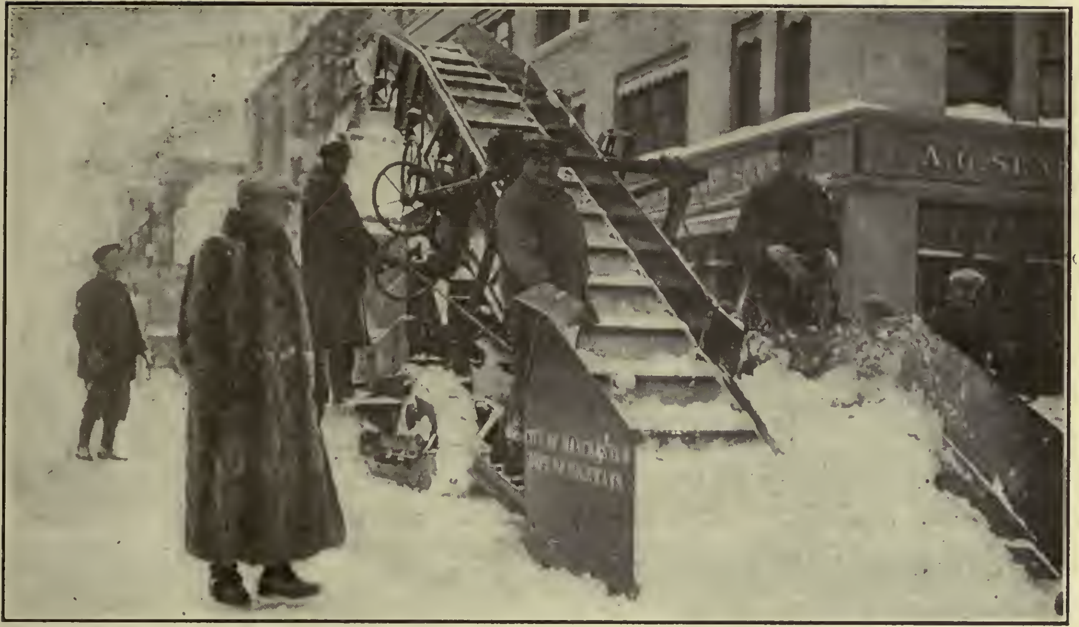
The relative merits of the various types of plows must be viewed from the point of local conditions. For ordinary city streets the blade plow is efficient and economical. It takes but a short time to attach and its first cost is comparatively low, so that with its use there is little capital tied up in plant lying idle the greater part of the year. The weak point of the combination is the truck. In order to increase the traction the truck body should be loaded and when this is done the combined hauling of the load and the strain of bucking the snow submits the truck to extremely severe usage. Then, again, its limited power restricts its use to the more level streets.

The tractor outfit is highly efficient and capable of handling the most severe conditions. But here is a piece of plant, costing at present-day prices about $8,000, whose use is confined to very short periods in a single season. It is true that the tractor can be used for a number of other purposes, but the need of these various uses must exist in order to bring down the large overhead otherwise charged to snow removal. In Manchester the tractor is used for heavy hauling and for dragging road machines, but even so there remains a first cost of $1,500 for the plow.

It is probable that for the lighter conditions of snowfall a five-ton tractor could be used to advantage, and where this is the case the money would be better spent in purchasing more of this type than in installing the heavier unit. Two five-ton machines, under proper conditions, will do twice the work of one ten-ton tractor and their use is well worth serious consideration. It is, however, poor policy to be underpowered and it is much more satisfactory to err on the side of having too much power than to have an outfit lie down on the job when most urgently needed.

In the principal business

PUSHER TYPE PLOW OPERATED BY 5-TON TRUCK CLEANING BUSINESS STREET IN MANCHESTER, N. H.



BARBER-GREENE LOADER REMOVING SNOW FROM PRINCIPAL STREET OF MANCHESTER

streets of Manchester the snow is removed after being plowed. In general the procedure is to plow the snow into the gutters and to load it into five-ton trucks by means of a Barber-Greene snow loader. This latter machine is one of the most efficient and altogether satisfactory pieces of plant that have been put on the market in recent years. With it the largest truck can be filled with snow in 15 or 20 seconds, when properly operated. The snow loader shoves into the windrow of snow, passing it up on an endless belt and dropping it into the truck body.

During the operation the truck backs along, closely following the loader. In some of the narrower streets snow is plowed from the sides to a row in the center of the street, where the loader picks it up on one run. Where the snow loader is operating in the gutters it is the practice to proceed against the traffic. In this manner the trucks follow the general direction of traffic in returning to the loader and in proceeding with their load. For the purpose of increasing the size of the load a truck body will hold, a hopper-shaped detachable top is placed on top of the regular truck body. In general, snow is dumped on the parks and commons, although provisions are made for dumping into one of the main outfall sewers and from two of the bridges.

The city of Manchester attempts to clean all of the sidewalks. For this purpose about 60 V-shaped wooden plows, drawn by single horses, are used. As this is strictly seasonal work, the city naturally does not maintain a sufficient number of horses available for the purpose and the plows are farmed out to various residents whose horses are not busy during the winter season. Each of these residents has a definite beat to cover and receives $4.00 per trip over the sidewalks in his district.

Waste from Leaky Spigots Piles Up Water Bills

HOW much householders must pay for waste of water from leaky fixtures is presented in a table by the Pennsylvania Public Service Information Committee. The figures were compiled in a town where the water rate is $1.50 a thousand cubic feet.

What the leaks cost the careless consumer or waster of water every three months is summarized as follows:

Size of Leak	Gal.	Cost
Steady drop, drop	2,160	$ .44
Very thin stream 1-32 inch (Small leak at faucet)	13,563	2.70
Thin stream 1-16 inch (Badly worn faucet washers)	54,243	10.85
Eighth-inch stream (Overflowing flush)	239,481	47.85
Quarter-inch stream (Small faucet left open)	957,933	191.60
Three-eighths inch (Large faucet left open)	2,241,000	448.20

Keeping the Country's Highways Open in Winter

Demise of Dobbin and Rise of Motor Truck Makes Snow Removal Imperative

REMOVAL of snow from the highways of the country is a matter of increasing importance each winter. Since 1906, the number of motor vehicles registered has increased from 48,000 to over fifteen million, while the mileage of surfaced road has increased from 150,000 miles to about 430,000 miles. Approximately 62 per cent of the motor vehicles are registered, and 53 per cent of the surfaced roads lie within the territory where the average annual snowfall is 20 or more inches.

The snow-clearing program of the states east of the Mississippi for the present winter includes 16,000 miles of main trunk line highway as compared with 13,000 miles for last winter, according to information collected by the Bureau of Public Roads of the U. S. Department of Agriculture. This amounts to about 30 per cent of the surfaced mileage in the states where snow is a problem, those north of the southern boundary of Virginia and Kentucky.

With the exception of a few small areas, the annual snowfall in this belt ranges from 20 to 130 inches, making the clearing of the above mileage an undertaking of considerable size. As indicating the size of the undertaking in various sections, the average annual snowfall ranges from 74 to 132 inches in Maine, from 25 to 92 inches in Pennsylvania, from 16 to 22 inches in Delaware, from 28 to 121 inches in Michigan, and from 9 to 101 inches in West Virginia. These figures taken from weather bureau records covering a period of years show that the problem of snow removal varies considerably in difficulty even in different parts of the same state. In nearly every state in the group the average maximum snowfall is more than twice as great as the average minimum snowfall, Delaware being the only conspicuous exception.

Snow is removed by state forces in Rhode Island, Connecticut, New Jersey, Pennsylvania, Maryland, Delaware, Virginia, Ohio, West Virginia, Illinois, and Indiana, and on one section of road in Minnesota. The work is left to counties, towns or other local units in New Hampshire, Vermont, Massachusetts, New York, Kentucky, Michigan, Wisconsin, and the greater part of Minnesota. In Michigan and Wisconsin the counties may be ordered by the State Highway Department to remove snow from state roads.

Pennsylvania, one of the pioneers in snow removal, may be taken as having an organization typical of those well organized for the work. The work is done by the State Highway Department with its regular maintenance forces and funds, the funds being derived from motor vehicle registration fees. The state is divided into four divisions, which are subdivided into 15 districts. Under the district engineers are 52 superintendents, 700 foremen, 6,300 laborers, 130 truck drivers, and 40 tractor operators. One hundred and sixty-seven trucks and 40 tractors are available, all of which are equipped with snow-plows, and also 300 road machines and drags. A garage and repair shop is located within the jurisdiction of each of the 52 superintendents. The equipment is kept in condition for instant use and the permanently organized maintenance force is ready to start work as soon as a few inches of snow has fallen. This organization has a program of 2,200 miles of primary roads to be cleared to an average width of 26 feet, and secondary roads to be cleared as far as practicable.

Representatives of the Federal Bureau who have visited all the states east of the Mississippi believe that state control of snow removal on the main trunk line roads is desirable in the interest of economy. Such work is easily coordinated with, and is really a part of, the maintenance of state roads.

Methods of snow removal vary considerably, but all states report that it is essential that work be started almost as soon as the snowfall begins and continued until the roads are cleared.

Pennsylvania, with an average fall of 48 inches, cleared 1,850 miles at a cost of $91,498, or $49 per mile. Connecticut, with an average fall of 73 inches, cleared 1,508 miles at a total cost of $175,022, or $111 per mile. Michigan, with an average fall of 74 inches, cleared 1,115 miles at a cost of $87,153, or $78 per mile, while Maryland, with an average fall of only 23 inches, cleared 2,000 miles at a cost of $20,000, or $10 per mile.

—*Michigan Roads and Pavements.*

Building Sand-Asphalt and Marl Roads in North Carolina

By W. F. Morson

District Engineer, Third District, North Carolina State Highway Commission

WITH the possible exception of Cumberland County, which borders on the Piedmont section of North Carolina, there is little if any native road-building material of the most common kind, such as gravel or stone, in the third district of the North Carolina State Highway System, with the exception of some marl rock deposits along the coast. Rather, the soil is of a rich agricultural nature, which is always poor quality for making roads, or else an abundance of sand with a scarcity of good clay for bonding purposes. Because of the scarcity of the more common road-building materials essential for even a dependable subgrade, it became imperative to adopt some type of pavement using local materials in many sections of the district where the cost of importing high-class material is prohibitive. This led to considerable prospecting and experimenting with such local material as was available.

VIEW OF THE PIT FROM WHICH THE MARL WAS OBTAINED

Sand-Asphalt Roads

One of the first special types tried out was the sand-asphalt which the state built with its own organization between Wilmington and Newbern, where there are miles of sand, much of which has the proper grading for sheet or sand asphalt. This is no longer an experiment, as the first pavement laid is over two years old and has proved so satisfactory, and its cheapness, as compared with other types of hard surface, has made it so popular, that it is now being laid on quite an extensive scale in many sections, particularly in the eastern part of the state, where there are ample deposits of sand with proper grading and good drainage and where the subgrade is of a sandy nature or can be made so at a minimum cost.

The sand-asphalt pavement consists of a base 3 inches in thickness, made up of 92 to 94 per cent sand and 8 to 6 per cent asphalt laid on a well-prepared subgrade which is generally and preferably sandy itself and confined with 2 x 8-inch wooden headers, either cypress or yellow pine, preferably the former when it can be obtained.

The top or wearing surface consists of 1½ inches of sheet asphalt. The most important requirements for success in this type of pavement, assuming, of course, that all the usual requirements for good sand or sheet asphalt are complied with, is that the subgrade be well drained and of a sandy

THE MARL-CRUSHING PLANT WITH INDUSTRIAL RAILWAY SERVING IT

nature, with the sand well confined with some suitable type of header.

The Development of Marl-Asphalt Pavement

One of the most interesting and valuable special types of pavement yet constructed in the Third District of North Carolina, is what has been locally named marl-asphalt. This type was not begun as such, but, like most special types, was the result of many changes in the original specifications made necessary by the difficulties met with in attempting to carry out the original contract, which called for an 8-inch water-bound macadam, after compaction, made with local marl rock.

The marl rock used is of a limestone shell formation, its make-up consisting of about 30 per cent lime with the remainder silica, iron and aluminum, possessing excellent cementing qualities and hardness after bonding but only fair toughness or resistance to wear.

The material is by no means a new discovery, as it has been put to many uses for several years as a substitute for other varieties of stone. It underlies thousands of acres of land in Pender, New Hanover and Brunswick Counties, but the best grade is in Pender in the vicinity of Rocky Point, where the quarry used in the construction of the projects was chosen.

Previous to the letting of the contracts, quite extensive surveys were made of the surrounding territory where the marl deposits were known to exist. In many places there were outcroppings. The quarry site near Rocky Point was chosen because tests showed the quality to be as good as, if not better than, elsewhere, the average overburden was as little as that of any other prospect, and it was so located as to give the minimum average haul for the two projects contemplated, particularly the longer Project No. 378.

Test pits were dug at the most likely location and it was found that the stratum was 8 feet or more in thickness, with an average overburden of 4 feet of clay. The samples taken showed two distinct grades of material, one a hard, well-stratified rock, and the other the real marl, which in its natural state contains a large amount of moisture, making it look like gray mud.

As the test indicated an ample supply of hard rock to construct all the projects contemplated as water-bound macadam, the original contract was let specifying a road of this type to be laid in two courses of 5 inches and 3 inches respectively under the regular specifications for two-course macadam.

The contract was awarded to C. W. Lacy, Wilmington, N. C., and he began operations by installing the pumping equipment. One of the chief problems throughout, but anticipated, was drainage of the pit owing to its low elevation and to the fact that all of the surrounding country was only a few feet above the Cape Fear River, the main drainage for this section. Next, a P & H steam shovel was installed and used for both stripping and quarrying the marl, which was drilled by steam, as it had to be shot to be handled readily. The necessary industrial railway system was put in to carry the marl from the pit to screens made of iron bars properly spaced, where the soft and fine marl was taken out, leaving the hard rock, which was then taken to the crusher and there crushed and screened to the proper sizes.

Very soon after operations were begun and only a short stretch of road had been constructed, it was discovered that the percentage of hard rock was far below what had been anticipated, running less than 20 per cent, while the softer marl ran over 80 per cent. Instead of having, as first thought, a stratum of hard rock on top of the marl, it lay in pockets and narrow veins.

This discovery made it quite evident that it would be impossible to carry on with the construction as then specified, using only hard rock, without wasting most of the material from the pit, consequently entailing considerable extra expense to the contractor and limiting the progress of the work to such an extent that it was doubtful if it could ever be completed. Following a conference between the state's engineers and the contractor, a supplementary agreement was drawn up and executed.

This agreement provided for the following design: a 5-inch base course, after compaction, of marl, and a 4-inch, after compaction, of hard rock with a maximum of 25 per cent marl in the top. In return for permission to use the marl, the contractor granted the concession of adding 1 inch to the thickness as noted above, and also another in unit price, reducing it from $1.26 per square yard to $1.20 on Project No. 378 and from $1.75 to $1.69 on Project No. 380.

After the completion of about 3 miles under this new design, it became apparent that there would be great difficulty in continuing the contracts without a considerable waste of marl, as the base was steadily gaining on the finished road because of the scarcity of the hard rock and the excess of marl. The base that had to stay open waiting for sufficient hard rock for the top course began to wear rapidly from traffic, dusted, and also washed from rains.

As a result, the contractor requested another conference with the state engineers, and another supplementary agreement was entered into to construct a base 6 inches thick, after compaction, using the run of the pit, or the marl and hard rock all mixed together, and import hard stone for a 2-inch, after compaction, top course. This new arrangement proved unsatisfactory to both the state and the contractor, as it was very difficult to get a well-bonded or tight surfacing with the imported stone and the cost of importing was prohibitive for the contractor at the agreed price for the completed road; therefore it was soon abandoned in favor of the final agreement, under which the contracts are being completed.

Final Agreement and Specifications

The final agreement effected was proposed by the contractor and accepted by the state, giving the following design: a base 6 inches thick, after compaction, constructed with the pit-run marl with 2 inches of standard sheet asphalt using local sand meeting specifications, all of which is confined within 2- x 8-inch wooden headers, either cypress or yellow pine. There is a modification in the asphalt consisting of a sand-asphalt binder, or cushion, as it is locally called, which is a mix of sand and asphalt in the proportions of 94 per cent sand and 6 per cent asphalt, and of varying thickness from ¾-inch to 2 inches, while the sheet top is reduced to 1½ inches, except where the base is of proper elevation to receive the 2 inches. This modification was made necessary because the marl base wore under traffic and weathered so much. Rather than haul additional marl to bring up the low places, and to eliminate the expense and trouble of scarifying to add this new material, the contractor requested permission to use the sand-asphalt cushion without additional cost to the state, and it was granted. When the sheet top is placed on the cushion, which has been thoroughly rolled, it is heated as near to the maximum specified temperature of 350 degrees F. as possible, so as to make a good bond. All samples taken out show a perfect bond between the cushion and the top. The new unit prices for the completed marl asphalt are $1.75 per square yard for Project No. 378 and $2.00 per square yard for Project No. 380.

To the casual observer the construction methods would appear to be a very simple process of preparing and rolling a good subgrade, then securely staking the wooden headers with stakes 24 inches long of the same material, after which the marl rock hauled in trucks is dumped and spread on the subgrade to a thickness of 8 inches, allowing 2 inches for compaction under rolling. It is then allowed to set or dry out for several days before it can be properly rolled with 10-ton

THE COMPLETED MARL MACADAM ROAD TREATED WITH TARMAC ON NORTH CAROLINA PROJECT 378 three-wheel rollers. The rolling is generally one mile behind the laying. The marl was usually about the consistency of green concrete when placed on the road, although every effort was made to get it as dry as possible at the pit, as it was found that it bonded as well dry as wet, and the more moisture the contractor could get out at the quarry the better it was for him, since he was paying for the hauling on a ton-mileage basis. A fleet of from 90 to 100 Ford trucks were used in hauling after the last change in type.

The engineers and contractor learned by practical experience a great deal about the marl and how to use it to the best advantage. It was always known that the marl could not be properly worked when in its wet plastic condition and it was thought for a long time that it would not bond if allowed to become too dry, so efforts were made to roll it when it was in a certain semi-moist condition. This created difficulties, as some sections ahead would often dry out before other nearer sections, and the roller could not get to them without going over the sections considered too wet to roll. Later it was found it made no difference how dry the marl became, as it bonded just as well, and the rolling was kept far enough back so as to permit the very wet material to sufficiently dry out. The inspector had to watch to see that the hard rock and softer marl were mixed fairly uniformly to secure the best results. Fortunately, the method used by the contractor at the pit assured a very good and uniform mixing of the two grades of marl by arranging his crusher so that hard rock after crushing and soft marl both came together in a bin beneath the crusher and were carried together by a chain bucket loader to the storage bin and there dumped by chute into trucks.

While there is no possible way of knowing as yet, from all appearances the marl asphalt will compare favorably with standard sheet asphalt on a concrete base. Although the marl base may not possess the slab strength of concrete, when laid on a dependable subgrade it should have sufficient slab strength to carry any load it will be subjected to for years to come, and its flexible nature should prevent any cracking of the surface in the event of slight settlements. It is the consensus of opinion of those who have inspected this type that it should give the same service that the more expensive types of hard surface give, and it may be said to the credit of the resident engineer and inspectors that, considering the method of construction, the asphalt surfacing is very smooth and even, making riding easy and enjoyable.

A Propitious Time for Installing New Street Lighting

STREETS built for the slow vehicles of bygone years were not particularly dangerous from the viewpoint of traffic. They were lighted chiefly as a protection against crime and as an aid to police patrol. With fast-moving traffic matters are now different. Even in the daytime accidents are numerous, but with inadequate lighting they are greatly increased. It has been estimated that traffic accidents in this country cost more than a billion dollars per year and that about 25 per cent of these are due to inadequate lighting. In other words, besides the various other benefits of good street lighting this country would save several hundred million dollars a year if its streets were properly illuminated. Since 1919 the number of automobiles has doubled, and there is no reason to believe that traffic conditions will not get worse. Street-lighting improvements and extensions have always been needed, and this need is rapidly growing more urgent. No one who has driven or dodged automobiles will fail to recognize the greater safety of adequately illuminated streets. Even the problem of glare from automobile headlights is pretty well solved where streets are well lighted.

Why is not the present time propitious for street-lighting improvements? Money is cheap and plentiful. Gold is piling up on every hand. It wants work to do. Bond issues can be advantageously floated under conditions which are seldom more attractive than at present. More and better street lighting is badly needed in many places. That it must be provided eventually is inevitable. Why not grasp the opportunity afforded by the present need and by the funds available? Improvement and extension of street lighting may be achieved now with less effort than when money is tight. —*Electrical World.*

El Paso Installs New Intensive Street-Lighting System

EL PASO, Texas, is said to be the first city of the South and Southwest to install a system of intensive white way illumination. Throughout the mile and a half of the business section the streets are to be illuminated to the extent of 450 to 500 lumens per foot of street, produced by two hundred and forty-four 6.6-ampere, G. E. form 20 luminous arc lamps, with high-efficiency electrodes. These will be mounted two lights to a standard, staggered along the curbing. The arcs, which are mounted on King standards, are enclosed in medium alabaster rippled globes, and are mounted about 21 feet above the surface of the road. The type of lighting unit was selected after considerable study and after samples had been tried in the streets. The installation is being made by the property owners and maintained by the Electric Company at the expense of the city.

Portable Air Rigs Aid Baltimore Water System

By W. B. Weathers

THE water-supply of Greater Baltimore has been the subject of long study and extensive investigation for many years. Actual development of a more modern system was begun in 1919. The first and most important stage in the development was completed in 1923, with the placing in service of the new Loch Raven Dam, which provides a storage capacity of 23,000,000,000 gallons of water, and will be ample to meet the average daily consumption requirements of the city, which are at present 120,000,000 gallons. The water flows from this dam to the Lake Montebello filtering plant through a tunnel 7⅛ miles long and 12 feet in diameter. From the filtration plant the water is distributed to the city mains.

PORTABLE COMPRESSOR, RUNNING DRILLS FOR ROCK EXCAVATION, BALTIMORE

Rock Trenching

The distribution of this water throughout the city is the largest task connected with the new development, and is unusually costly, because of the fact that the main trunk lines and feeders must be run through solid rock foundation for many miles.

If this enterprise had been attempted 15 or 20 years ago, it is problematical whether the city could have afforded it, or whether it could have been completed by the methods then available. To-day, thanks to the development of the small but powerful air-hammer drills,

PORTABLE AIR COMPRESSOR READY FOR OPERATION IN CALKING PIPE JOINTS, BALTIMORE WATER DEPARTMENT and of reliable and effective portable air-compressor outfits, the work is being done at relatively small cost and at a commendable rate of speed. In fact, compressed air and its adaptation to street work may be said to be responsible for the success of this development, which is so important to the safety and health of the city.

The compressed air trenching equipment of a standard trench-digging gang consists of one gasoline-driven trenching machine; one Sullivan Class WK-31 gasoline-engine-driven portable air-compressor; one standard-gage gasoline-driven 10-ton hoist; two Sullivan Rotator hammer drills; one Sullivan compressed-air spader or clay digger, and the necessary calking tools, lead pots, etc.

The trenching machine, air-compressor and hoist are given very severe duty, as their portable character enables them to be moved rapidly from one job to another, so that while, for example, calking for one gang is completed, and this gang is waiting for the pipe gang to catch up, the outfit is moved to another job for operating rock drills or calking tools. By using one compressor for several jobs in this way, the overhead expense on the air tool work is reduced to a minimum.

In 1919, the first two-hammer drill portable compressor was purchased. This machine had a piston displacement of 150 cubic feet per minute. The compressor and gas engine were mounted on a steel frame with solid cast-iron wheels and solid axle construction. The wear and tear on this unit, when hauled constantly over rough streets, was very noticeable, compared with that of compressors of the same type, which do not have to be moved extensively.

Later units reduced this depreciation by mounting the outfit on a trailer type truck equipped with rubber-tired wheels and springs. These trucks minimize vibration, both when the compressor is in operation and when it is being hauled from one point to another. They secure the same life, practically speaking, as that enjoyed by a stationary machine, while retaining the portable feature, which is absolutely necessary in constructing a number of miles of underground pipe lines.

Use of Drills and Spaders

Much of the clay-digging work is done by the special trenching machine, which handles the clay in open-cut trenches in a very effective manner. For the trenches or enlarged portions of the trench, however, where the pipe valves are set, the pneumatic spader finds advantageous use as compared with hand picks, due to the small working space available. The compressed-air spade can be handled with but little effort on the part of the runner in cramped quarters where he could not swing a pick to advantage. The spade used in this class of work is 5 inches wide, with a short shank. This tool is very easily handled and more convenient than a longer and more bulky type of spade.

In the city proper, the one-man drills put in holes not exceeding 6 feet in depth, as the city officials will not permit heavy shooting. In the suburbs, when the depth of the trench warrants deeper holes, the same drills easily put in 14-foot and 16-foot holes.

The city of Baltimore finds this portable compressor very convenient for this work, as to capacity, as well as in portability and ease of handling. The demand for air varies with each job, and this compressor, with its slow speed at maximum rating, may be used as economically on one calking tool as when operating several spaders or hammer drills, as the amount of work varies in direct proportion with the power consumed. The Water Department of the city of Baltimore at present has seven Sullivan portable compressors, three of which are equipped with rubber tires, and seven hammer drills and one spader.

In order to keep its hammer drills supplied with properly sharpened and tempered steel at all times, the Baltimore Water Department has a class A, all-hammer drill-sharpener with full equipment of dies and dollies and a pneumatic bit punch; a drill steel oil-heating furnace with an electric pyrometer, and a 9 x 8-inch single-stage, belt-driven air-compressor.

A School of Play and Recreation

A SERIES of practical and intensive courses in play and recreation, for playground directors, community workers, club leaders and camp counselors, has been announced by the Heckscher Foundation. The subjects covered include games, athletics, dancing, story-telling, swimming, handicraft, dramatics, and music. The fall term will begin on October 6, morning sessions to be held on Monday to Thursday, inclusive, from 9:30 until 12:00 o'clock, and evening sessions on Monday, Tuesday and Thursday from 7:00 until 9:30 o'clock. Full information as to tuition fees, etc., may be had upon application to Miss Madeline L. Stevens, director of the school, at the Heckscher Foundation, 1 East 104th Street, New York, N. Y.

Passaic Valley Trunk Sewer Completed

Thirty-Year Effort for Removal of Pollution from Passaic River Results in Remarkable Engineering Project

LARGE projects inevitably must pass through vicissitudes, but it is probable that few have had as large a share of difficulties and delays to overcome as the $20,000,000 Passaic Valley trunk sewer, which has finally arrived at the point of completion and the flume opened from Paterson to New York Bay for actual use. It is almost 30 years since the first suggestion was made to clear the Passaic River of sewage by the construction and operation of an intercepting sewer to the sea, but it is only a dozen years since the construction work has been actually under way.

One of the first stumbling blocks in carrying out this project was the reluctance of the smaller communities to participate, their first objection being against the method of apportioning the cost. Opposition, first finding concrete expression in the New England Society of Orange, was based on the contention that the municipalities should be assessed according to their prospective use of the sewer rather than on their tax ratables, the method adopted finally. These objecting municipalities placed argument after argument before the Sewer Commission to carry their point, but were unsuccessful and then began to cast about for some other way to obey the mandate that soon took form in legislation forbidding pollution of the river by sewage.

SECTION OF 96-INCH TUNNEL OF THE PASSAIC VALLEY SEWER

Suits Caused Delays

Two lawsuits, one brought by Paterson, which was among the reluctant municipalities, and the other by New York City, which objected to the prospect of pollution of its waters, operated to cause the longest delays. Both of these suits were won for the sewer project, and Paterson eventually joined in. The New York suit had one result in bringing about a decision to have the sewage treated before being emptied into the bay.

Year after year a new date for the end of pollution was set by the Legislature, and year after year this date was extended as one thing or another arose to delay getting at actual work. In the meantime, about every known method or scheme for treating sewage so that it would not pollute running streams was tried out by one or another of the dissenting mu-

A PART OF THE BATTERY OF SEPTIC TANKS AT THE NEWARK BAY PUMPING-STATION nicipalities in the district affected by the sewer act, and one after another these schemes were all abandoned. As this occurred, each municipality signified its willingness to join in the scheme, and the most important step came when East Orange, originally balking at a $500,000 estimated cost, agreed to pay Newark $825,000 as an initial price for taking care of the sewage from the suburban municipality. Orange, which only recently applied for a share of the project, was the last to fall in line.

The original municipalities participating with Newark were Paterson, Passaic, Harrison, Kearny, Belleville, Clifton, Nutley, East Newark, Garfield, Lyndhurst, Rutherford, East Rutherford, Wallington and North Arlington. Those which came in afterward, besides Orange and East Orange, are Montclair, Prospect Park, Haledon, Glen Ridge, and Bloomfield.

Twelve Years' Construction Work

In the twelve years the work of constructing the sewer has been under way 165 separate contracts have been awarded, 30 miles of pipe laid in solid ground, 10 miles or more of tunnels driven beneath two bodies of water and underneath a city, 3 pumping-stations and a gigantic clarification plant built, and approximately $20,000,000 expended. Incidentally, several contractors have seen their hopes of financial success fade as they were crushed beneath the weight of unanticipated rises in cost. On one section line three contractors failed and the work had to be completed by the Commission itself.

Starting at River and Prospect Streets, Paterson, the land end of the sewer, the big flume through which a man can walk erect, wends its way through a half-score of municipalities to the banks of Newark Bay, where the filtration basins and the largest of the three pumping-stations are located. Then the flume passes underneath Newark Bay at a depth of 250 feet, and under the city of Bayonne, from which it passes into New York Bay and continues underneath the latter for approximately 15,000 feet.

Along the line of the land sewer, in addition to the Newark Bay pumping-station, are two others, one at the junction of the Third and Passaic Rivers, designated as the Yanticaw station, and the other at Clifton, known as the Wallington station.

Five major steps are necessary when the sewage reaches the clarification plant on the meadows to make it suitable for discharge at the outfall tunnel under New York Bay. As the sewage reaches a point 50 feet from the pumping-station it passes into a chamber divided into three parts. In each chamber is a pit several feet deep. As the sewage passes through these pits, all gravel and stones fall to the bottom. A clam-shell bucket will remove the gravel, which will be carried by cars to the near-by meadows for fill. Beyond these grit chambers the sewage enters the screen house, where three sets of electrically operated double screens are installed. These screens catch all floating débris that has come past the grit chamber. The remainder of the sewage goes to the clarification tanks. The two screens in each set are raised alternately, the materials caught in them raked off and pressed into cakes, dried and burned in the boilers. The sewage meantime passes through a set of fine screens, and then it is pumped into the clarification tanks.

The tanks are built of concrete. Underneath them runs a series of galleries in which are located the mechanism operating the various gates which control the sewage and the system by which the tanks may be cleansed by sea water obtained from Newark Bay.

The Clarification Tank

Three sets of pumps are required to carry the sewage to the clarification tanks, which are about 300 feet from the pumping-station. These pumps are about 40 feet below the surface and operate at a speed of about 100 revolutions a minute, capable of handling 100,000,000 gallons daily. Space has been provided for installing a fourth unit when it shall be required.

Reaching the clarification tanks, which are built in 4 sections of 27 units each, or 108 in all, the sewage flows through the tanks at a speed of one-half an inch a second, with the result that the suspended matter settles to the bottom, which is hopper-shaped. When the hoppers are filled to a certain level with sludge, a gate is opened in the bottom and the pressure of the water above sends the sludge through a large pipe to the water-front, about 2,000 feet away, to be loaded on tank barges and carried more than 10 miles out to sea for dumping.

The sewage, from which a large portion of organic matter has been removed, runs to the water-front and falls 250 feet into the tunnel which runs underneath Newark Bay across Bayonne and out into New York Bay, a distance of five miles.

To facilitate repairs to the pumps, an electric traveling crane is installed in the main pump-house. This crane has a capacity of 20 tons.

The Power-Plant and Pumping-Stations

Nine tubular boilers, each of 250 h.p., located in an annex to the pumping-station, furnish the power for the pumps. Room has been provided for the installation of a tenth boiler at the time the fourth pump is added.

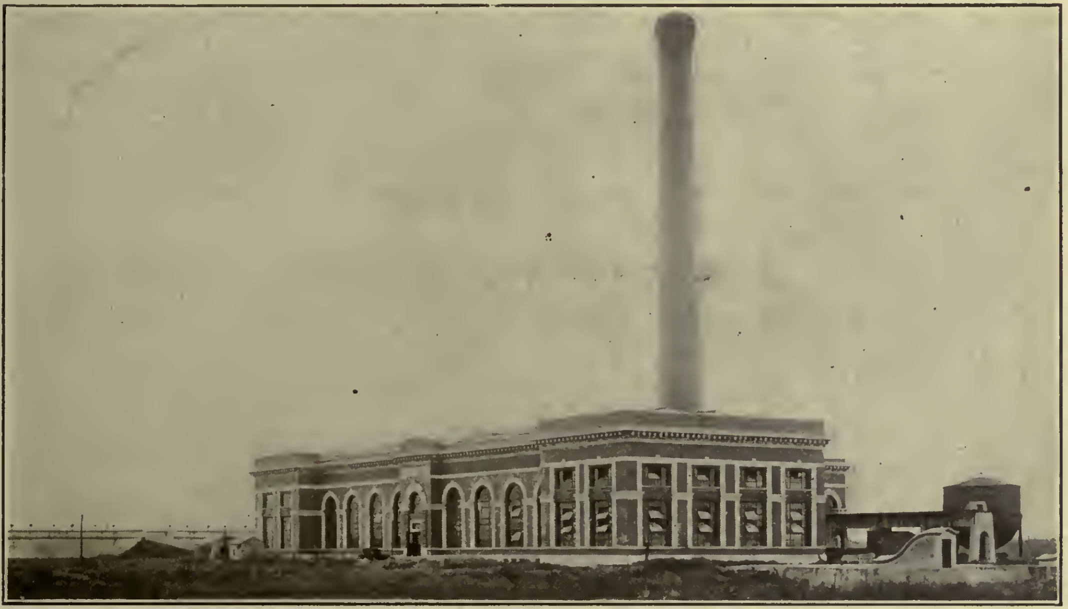
Coal for the power-plant is stored in a building capable of holding 10,000 tons at one time. The plant has its own railroad siding running from the Newark Bay Railroad, the tracks rising on a trestle that passes through the coal storage house high above the floor.

Elimination of odors about the plant will play a considerable part in the operation. In so far as the pumping-station itself is concerned, it is believed that the greater part of this elimination has been solved by the erection of a 200-foot stack, running to which are flues from various sections of the station.

The isolated location of the sedimentation tanks in itself solves some of the problems of odors from the tanks, but the real problem will present itself when the surrounding section begins to build up. Plans have been made so that when this occurs the tanks can be covered and the odors conveyed through flues to another giant chimney to be built when occasion requires.

The Yanticaw and Wallington pumping-stations are small compared to the one on the Newark Bay front. The former is capable of handling 6,500,000 gallons of sewage a day, while the latter can handle approximately 30,000,000 gallons. The Yanticaw station will handle the sewage from the low-lying section of East Rutherford and adjoining towns, while the Wallington station will care for the sections of Passaic, which are below the level of the main sewer.

At the time the sewer was planned, in 1912, it was to have been completed by 1916. At that time the estimated daily flow of sewage in the cities to be served was approximately 90,000,000 gallons and the flume was designed to care for the output of these municipalities until 1940. In the meantime the flow has steadily increased, and instead of 90,000,000 gallons it is estimated the flow will be approximately 130,000,000 gallons a day. This will have no bearing on the date when the maximum capacity is expected to be reached. Some years hence the municipalities along the Passaic will again be forced to discuss an extension of the sewerage works.



THE NEWARK BAY PUMPING-STATION

Measurement and Analyses

Careful watch will be kept on both the quantity and nature of the sewage passing through the trunk sewer. It will be measured as it passes from the pumping-station to the tank, and careful analyses will be made daily to determine just what kind of waste is turned into the sewer.

In the northeast corner of the meadow pumping-station a complete chemical laboratory has been installed. Not only will the sewage be analyzed, but frequent analyses will be made of the waters of New York Bay so that friction between the Passaic Valley Trunk Sewer Commission and New York City may be avoided. It has been because of the friction that has already occurred that the completion of the sewer has been delayed. New York City in its litigation bitterly fought the project to make the outlet of the sewer in New York Bay, and succeeded in having the Federal Government, through the War Department, intervene in the suit, but later the Government withdrew and a decision was given by the United States Supreme Court in favor of the Commission. No effort was made to do construction work at the New York end while the litigation was under way, as it was felt that this would be an affront to the Court. Work was done, however, on the Paterson end, thus building the sewer backward.

ACKNOWLEDGMENT.—Illustrations by courtesy of *Newark Evening News.*

Water-Supply

THE human race must have recognized, even in its earliest days, the relation of water to life. Even the nomadic tribes had their movements guided by the location of oases and streams, and it is well known that the first civilizations developed along the shores of such rivers as the Nile and the Euphrates. Wells were common in ancient Egypt, and some of them appear to have been of great antiquity. Likewise the practice of impounding water in reservoirs and holding it for times of need is known to have existed long before the beginning of the Christian era. There were great rain-water cisterns in Carthage as early as 150 B.C., and at Athens there were infiltration galleries for collecting ground water-supplies. Water-supply may therefore be regarded as one of the oldest among community requirements. It antedates fire protection, sanitation, poor relief, education, and most of the other activities upon which a modern city bestows attention.—*Exchange.*

Cleaning Water-Mains in Scotland

THE water-supply of Helensburgh, Scotland, is obtained from the Ballyvoulin Burn, 3 miles distant from the reservoir. The water, after settling, does not require filtration, and the existing filter beds, which are inadequate to deal with the present consumption, are to be emptied and used as storage tanks. Trouble has been experienced with the growth of a variety of chara in the reservoirs, necessitating occasional emptying and cleaning. The weed does not flourish on the pitched surface of the banks, in those parts occasionally exposed to air and sun, or at depths greater than 12 feet.

Greater difficulty is caused by the growth of a fairly soft nodule of rusty appearance composed of hydrated ferric oxide and vegetable matter in the mains. In one instance a 5-inch pipe on a gradient of 1 in 7 was rendered impenetrable to water under a pressure of 75 pounds. Surfaces completely coated with nodules to 1¼ inches in thickness are frequently encountered. The two 8-inch pipes which convey the water from the fountain head to the reservoirs were scraped in 1909 and in 1920, the capacity being increased from 40,000 gallons per hour to 52,500 in the former year, and from 35,000 to 51,000 in the latter. In 1920 the scraping was carried out with a Glenfield scraper at a cost of 3d. per yard. The town pipes were cleaned by hand, 85 yards in each direction being dealt with from one opening, at an approximate cost of 3d. per yard per inch in diameter. The scraping considerably more than doubled the discharge from certain hydrants and the day pressure was increased from 45 to 80 pounds and the night pressure from 85 to 106 pounds.

STREET LIGHTING 75 MILES AWAY AS SEEN FROM THE SUMMIT OF MT. WILSON, CALIF.

In the foreground of this remarkable picture will be seen Pasadena. The irregular patch of dense light, slightly blurred, is Los Angeles, stretching out to the right into Hollywood. This picture was taken solely by the light from street-lighting installations and the multitude of automobiles which traversed the streets of these communities during the two hours that the plate was exposed

The Difficulties of Street Cleaning

Abstract of a Report on Municipal Street Cleaning in Philadelphia, by the Bureau of Municipal Research of That City

THE actual cleaning of the streets probably appeals more to public imagination than does any other service performed by the street-cleaning division. Public decency and convenience require that the streets should be kept reasonably clean, while consideration for the public health demands that at frequent intervals there should be thorough cleansing, especially of much-used streets.

It is obviously impracticable to keep all the streets clean at all times. Even if expense could be disregarded, there are many practical difficulties. In the down-town district of any city, by using a very large number of "block men," or "white wings," it would be possible to remove accumulations of dirt so frequently that the streets would have the appearance of great cleanliness. Yet they would be covered with a fine dust that the block men could not remove, and this fine dust on a windy day would prove extremely objectionable. It can be removed only by cleaning methods that cannot be used during the working day, when the traffic is heavy. Even though this fine dust is removed during the night, there will be a new accumulation before the following business day is over. Some of this dirt comes from the sidewalks, which the city does not clean, although they are a part of the public highway; and some comes from store sweepings which are placed in the street in violation of city regulation.

The appearance of the workmen has not received sufficient attention. Neat workmen may inspire the public with a desire to co-operate in the work of keeping the streets clean.

Unfortunately, the kind of paving used on many miles of streets cannot be thoroughly cleaned. The streets paved with rough, traffic-worn, granite blocks, originally laid on a dirt foundation without a joint filler, can, of course, be given only a rough cleaning. These streets, however, produce little dust on a windy day, because the dirt is held in the depressions between the blocks. While sheet asphalt paving, laid on a concrete base, can be very thoroughly cleansed with water, provided the street grades are not too flat, there are many miles of older asphalt pavements, laid on a broken-stone base, and now uneven of surface and frequently in wretched repair, which cannot be readily or thoroughly cleaned.

Relative Value of Various Methods of Street Cleaning

To analyze the methods of street cleaning now employed in different sections of the city, or to attempt to indicate what methods are best under the conditions encountered, is not considered within the scope of the report. It is stated, however, that it should be understood that there is no one method of street cleaning that is effective under all conditions of pavement surface, street traffic and weather. The most effective and economical apparatus and methods must be determined by study and experience, and the apparatus and methods must be changed from time to time as conditions require. Perhaps the motor flusher has at present the greatest all-round usefulness; but it cannot be used on many of the older pavements, especially those composed of blocks laid on a dirt base. However, on a smooth, impervious pavement which has a proper crown and grade, the use of sufficient quantities of water under pressure, as from a motor flusher, is very effective in removing not only the coarser dirt, but also the finer dust. This is especially true if the street is flushed twice, or if it is sprinkled prior to flushing. Water may also be applied by hose flushing, although this method is used less now than formerly. Vacuum sweepers have given a certain amount of satisfaction in some cities, but they are of no value when the pavements are wet. The horse-drawn broom is used more or less in practically all cities. It removes only the coarser dirt, and on a smooth pavement usually smears the dirt in a thin film over the entire surface. On rough pavements, where a high degree of cleanliness cannot be obtained, the use of horse-drawn brooms is doubtless economical. The motor sweeper, which sprinkles and sweeps with one operation, and which is usually provided with a pick-up belt and a dirt-storage box, should not be viewed as a new method of cleaning but only as a step in the substitution of motors in place of horses and men. The motor sweeper is also made with a special broom for cleaning the gutter. Like some other forms of street-cleaning equipment, it operates best on well-paved streets with an even curb and gutter. Its use on roughly paved streets is destructive of the mechanism.

Of great importance in the list of facilities are the block men, or white wings. It is impossible to build a machine that has the intelligence of a workman. The hand-broom sweeper can do certain kinds of cleaning that a machine cannot do at all. The so-called alleys must be cleaned by hand labor, and on streets with numerous depressions or irregular gutters, hand brooming alone is effective. If the block man cleans only the gutters and the scattered accumulations of dirt on the crown of the street, he is capable of covering a considerable territory in a day's work. Automobile traffic throws the dirt from the street into the gutter, and in many localities all that needs to be done to make a street attractive is to clean the gutters and to pick up the litter. In districts with well-paved streets, cleaning by block men is very effective if supplemented by flushing. As a result of a detailed study of methods, the officials of the Street-Cleaning Division in Philadelphia are of the opinion that the number of block men will be further increased by as much as 75 per cent in a few years. If block men are to become so important a part of the organization, their wages should be increased so that better laborers can be obtained. Heretofore, the most inefficient and the physically defective have been used for this work.

The appearance of the workmen has not received sufficient attention. In the eyes of the public, block men personify the street-cleaning work, so that untidiness may easily be assumed to imply inefficient work. Neat workmen, on the other hand, may inspire the public with a desire to cooperate in the work of keeping the streets clean. It is probable, also, that a man who is neatly uniformed will feel a desire to justify his equipment and appearance and will do better work. For these reasons, it is important that the block men be neatly dressed when they are at work; and as the white uniform is typical of cleanliness and has become traditional in this service, it should be continued. In order that the cost of this equipment may not prove burdensome to the workmen, provision should be made for it in the wage.

Street Improvements in Fernandina, Florida

FERNANDINA is a city of about 6,000 population, situated at the northeast corner of Florida on an island. The first street improvement consisted of grading shallow ditches along the sides and throwing the spoil in the center, after the manner of improving country roads. When traffic conditions demanded hard surfacing, this was accomplished by dumping on top of the elevated streets a layer of oyster shells from 4 to 12 inches thick. Thus, in the course of time the streets were built up to a height from a few inches to a few feet above the abutting property, and even the streets themselves had depressions between intersections from which the water could not escape. In a country subjected to an annual rainfall of about 60 inches, and an occasional 24-hour precipitation of 8 inches, such elevated streets produced conditions somewhat annoying.

Since the commission-manager form of government was put into operation in September, 1923, grade lines have been run on shelled streets in the vicinity of occupied blocks, and elevations taken on property adjacent thereto. From these data a topographic map has been prepared with 1-foot contour intervals. After considerable study and a large amount of cut-and-fill, permanent street grades were established, and profiles platted on tracing cloth to a horizontal scale of 50 feet to 1 inch, and a vertical scale generally of 1 foot to 1 inch. The absence of large flat areas and the presence of many small ridges and hills permitted permanent street grades to be so fixed as to be, at all places, below the adjacent property, and yet not flatter than 0.2 nor steeper than 4 feet per hundred. This work is still in progress and has been carried well beyond any possible early need.

It is proposed to systematically regrade and resurface a few streets at a time, so that all will be brought to the new established grade within a reasonable period and without undue financial burden. A sum equal to about 10 per cent of the annual tax income will be so used each year. For the first year none of this work could be done, as it was more essential to oil certain streets and make extensive repairs to all shelled streets, which had been long neglected. In addition to this, the city built more permanent pavements in the past year than during its entire previous history. For so-called permanent pavements the city pays one-third and the abutting property two-thirds of the entire cost. The old City Council administration incurred certain debts without providing financial means for discharging them. The new administration had to include these as "Extraordinary Expense" in its first budget. The permanent pavement program was limited this year to a cost which would permit the city to retire its proportion by including in the next three annual budgets for street work an additional sum equal to the amount of this extraordinary expense, and the work was financed without the issuance of bonds.

The Essentials of an Efficient City Engineering Department

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THERE are five essentials in an efficient city engineering department: (1) a well-qualified city engineer; (2) carefully and sharply defined duties and powers; (3) a loyal and capable organization; (4) satisfactory quarters and sufficient equipment; and (5) complete records painstakingly kept.

Essential No. 1—A Well-qualified City Engineer

A really well-qualified city engineer would have the disposition of an angel and the education and the technical skill of all the scientists that have added their bits to the sum of the world's knowledge. Physically and temperamentally, the city engineer needs, under existing circumstances, a good appearance, a persuasive tongue, and a thick skin. His education must be broad and general and at the same time specific and detailed. It seems needless to add that this education should be along engineering lines, but occasionally this basic requirement is overlooked. After considering the various qualifications for a city engineer as regards training, it would seem that no man should be considered for the position of city engineer unless he has a college degree or else very exceptional ability well proved.

> **In his relation to the public, the engineer occupies the position of an expert and must stand ready, if need be, to sacrifice personal popularity to the public's good. I do not mean that eternal disagreement with his public entitles him to a place in the Hall of Fame. Neither do I mean that he should extract a martyr's joy from public criticism. Rather he should be hurt, cruelly sometimes, by public censure even when he knows that censure to be unmerited. In his contact with the public the city engineer must be patient to the highest degree. It is part of his job to meet the public and its individual components about 40 per cent better than half-way.**

With these rather sketchy remarks, now let us consider the city engineer in his relation to the four things with which, officially, he has mainly to deal. These four things are: the administration, the public, the contractors, and the subordinates.

The relation of the city engineer to the administration of which he is a part has been the subject of discussion that has, at times, shown a trace of acidity. A group of city engineers, thinking, I fear, rather of their own petty dignity than of the principles of good organization, have for the last half-dozen years or so been agitating more or less violently for freedom from the nominal leadership of the chief of the public works department. I believe that this move is ill-advised. The besetting evil of municipal government to-day is the existence of a multiplicity of independent and semi-independent departments, boards and commissions, whose functions cross and crisscross and overlap until even ordinary efficiency is lost in a maze of red tape and buck-passing. The sooner we realize that good organization calls for the simplification of the present awe-inspiring conglomeration of independent municipal agencies into four—surely not to exceed six (Finance, Public Works, Public Safety, Public Instruction, Public Welfare and Law) — properly coordinated and centralized departments, the better for all concerned. One of these should be the Department of Public Works, which should be divided into two bureaus, the Bureau of Construction and the Bureau of Maintenance. The city engineer should be the head of the Bureau of Construction.

I would make two radical changes in the status of the city engineer affecting his relation to the administration: first, I would remove him entirely from contact, except in an advisory capacity, with the general executive functions of the municipality; and, second, I would make the position a real, honest-to-goodness, civil service position. In being released from contact with the general executive functions he would relinquish his chair or chairs in the governing board or boards of the city, such as Boards of Contract and Supply and Boards of Estimate and Apportionment. He was probably placed on these boards, where they exist, because it was felt that his technical knowledge might be needed at times by the boards. The fact that this technical knowledge is just as available in an advisory capacity, and, in such a capacity is likely to be less fettered, was overlooked. If there is any man in the city employ who should be "out of politics" for good, sound political reasons, it is the city engineer.

The second suggestion was to make the city engineer a civil service employee. It took me a long time to arrive at that decision. A vivid picture of the average disloyal, time-serving, civil service employee held me back. Even now I only accept the idea as the lesser of two evils and I am ready to admit that the wrong sort of individual in the position of city engineer will undoubtedly make the plan a lamentable failure. Put a cantankerous fool or an inclinational pauper—I refer to the man who fails to realize that accepting a dollar for seven cents worth of service reduces the acceptor to the level of a pauper, and a dishonest pauper at that—into the position and you will rue the day the change went into effect.

This portion of the paper dealing with the relation of the city engineer to the public holds infinite possibilities for unnumbered platitudes and semi-religious sob statements. I shall endeavor to avoid them. In his relation to the public, the engineer occupies the position of an expert and must stand ready, if need be, to sacrifice personal popularity to the public's good. I do not mean that eternal disagreement with his public entitles him to a place in the Hall of Fame. Neither do I mean that he should extract a martyr's joy from public criticism. Rather he should be hurt, cruelly sometimes, by public censure even when he knows that censure to be unmerited. In his contact with the public the city engineer must be patient to the highest degree. It is part of his job to meet the public and its individual components about 40 per cent better than half-way. Such an exercise of patience does not necessitate any infringement of self-respect. The engineer should religiously avoid any superfluous idea of his own superiority. Any time he catches himself referring to the non-technical components of the public as "laymen" he should pick a fight with a local Dempsey and take a beating as the only sure way of bringing his view-point back to normal. Personally, I feel that the city engineer should take the attitude that he is working for the public and that if every man who comes to his office for the purpose of registering a complaint knew as much about engineering or municipal procedure as the engineer himself, there would be scant need for engineers.

It has been my observation that the engineer who enjoys the reputation of being a difficult man for contractors to get along with is usually acclaimed the paragon of virtue by city officials and citizens alike. This is most unfortunate, because an engineer, in his effort to court popularity is most likely to fail to distinguish between firmness and foolishness. It is so easy for the engineer to bathe in the public esteem by adopting the popular view-point that a contractor is just naturally a criminal. If this merely affected the engineer, it would not be a matter of concern. It does, however, affect to an unmeasurable degree the city in whose interest the engineer is supposedly working. Contractors are business men. They are in the contracting game to make a living. If they do not succeed in making a living, they drop out of the game, and others, more successful, take their places. If a city engineer establishes the reputation among contractors of puttering over unimportant details, of sneakingly placing things that he forgot on the shoulders of the contractor, it must not be forgotten for a single instant that the contractor adds a percentage to his bid that is ample to protect him from these whims, fantasies and failings.

The engineer who has the courage to be fair with contractors is an asset to the city that employs him. He has a worth in actual dollars and cents to the municipality that can only be approximated. I have absolutely no patience with, or regard for, the engineer who writes his specifications in such a way that he can make the contractors responsible for anything and everything which he himself may forget. Such a man is not only a poor engineer, but he is a coward and an economical failure. I do not say that an engineer should forget to be firm. He should write specifications that are fair, he should draw plans that are comprehensive and clear, and then he should insist that these specifications were written and these plans drawn to be followed without variation, except in unanticipated contingencies, in the execution of the work covered. In other words, he should endeavor to convince the contractors that they will be treated with impartial firmness and fairness.

The relation that exists between the city engineer and his subordinates is complicated and made nearly impossible by the existing civil service law in many places. You will remember that in an earlier paragraph I recommended that the civil service law be extended to apply to the city engineer. I am now going to recommend that the same law be restricted so that all subordinates in the city engineer's office are removed from its protection. I realize that this is not strictly logical. You will remember, though, that the recommendation to place the city engineer on a protected civil service status was made only as the lesser of two evils. I believe that the practice of protecting rodmen, chainmen and clerks by the civil service is an untold loss of efficiency. It is the tendency for the employees under this system to feel that they are not responsible to their immediate superior and to assume that efforts to please him are relatively unimportant. I further believe that the operation of civil service requirements is such as to bring mediocre or inferior persons into the city service and to retain them there, while the superior employee becomes disgusted and quits. It is to my mind one of the most important essentials that the city engineer be allowed to develop, independent of any outside influence, a personnel in his office that will respond, because of a proper morale, to any request or demand that he may make of it. I believe that this will be best secured by making the city engineer the only civil service employee in the engineering department. If that condition exists, it will be unnecessary to protect the subordinates. If they are worth the money that the city pays them, they will be loyally protected by their civil service superior.

The Essentials

I. A Well-qualified City Engineer

II. Carefully Defined Powers and Duties

III. A Loyal and Capable Organization

IV. Satisfactory Quarters and Sufficient Equipment

V. A Complete System of Records

In spite of the deadening influence of the present civil service, I feel that any city engineer is a failure who does not at least try to develop an esprit de corps among his force. He should place upon each employee a definite degree of responsibility and should strive in every way to make the work of the office interesting. Weekly conferences, even on city time, are worth more than words can tell.

Second Essential—Carefully Defined Powers and Duties

The second essential is a clear and sharp delineation of the powers and duties of the city engineer. In the average city charter these powers and duties are poorly defined, to say the least. Sometimes, as in the case of paving procedure in second-class cities, the charter provisions are almost pernicious. The city engineer should have direct charge under the supervision of the head of the public works department, of all engineering work undertaken by or for the city. This work includes not only all required surveying and mapping, but also the planning and construction of all public work that would nominally be supervised by an engineer or by an architect. I refer to schools and hospitals and fire houses, as well as sewers and bridges and pavements. I do not mean that municipal engineers shall set themselves up as architects, but I do believe that any part-time or full-time architect employed by the city should work under the direction of the city engineer. I feel that there is need for more engineering and less architecture in the majority of our public buildings.

Making the engineer responsible for all municipal engineering work is only one step in the classification, coordination and consolidation of municipal functions that most of us realize to be so necessary. The day is coming when your assessors will be responsible for all assessment work; when your city treasurer—unless you decide that you can get along quite as well without one—will be responsible for the collection and disbursement of all city money; when your councils will consent to become truly and merely legislative bodies. Then I expect you will eliminate the engineer in the water bureau and the engineer in the educational department and the engineer in a dozen or more other offices and consolidate their duties and functions in the hands of one man—your city engineer.

Third Essential—A Loyal and Capable Organization

In regard to the organization that is allowed to the city engineer, there is much that might be said. I will crowd it all into the bald statement that usually the organization allotted to the engineer by the council or controlling body is utterly and entirely inadequate. The board members and the councilmen are thoroughly convinced that the engineer is a hopeless dreamer who needs the scrutinizing care of practical men to keep him from paving the streets with "moire silk."

I believe there exists a fairly definite ratio between the size of the force required by the city engineer and the population of the city. It seems that a fully adequate engineering department requires a field party of three men, headed by an instrument man, for about every 30,000 of population. In arriving at this figure, I have in mind the ordinary routine work now performed by the average city engineer. There should be an assistant engineer for each class of work for which the office is responsible. For example, if the city engineer has charge of pavements and sewers and water-mains, he should be allowed three assistant engineers, one of whom should be assigned to each of these functions. A well-balanced office requires one draftsman for each field party. A clerical force is needed consisting approximately of one person for every 50,000 of population in the city in question. This organization is headed by a deputy, or, in case the architectural work is also assigned to the city engineer, by two deputies, one of whom should be an architect. With this organization the engineer should be able to care for all the routine work that may be required of him. Special jobs of any magnitude cannot be handled by this organization without neglecting the ordinary routine work. The field parties should not be definitely assigned to any particular work, but should be attached as needed to the work directly supervised by the assistant engineers. The same suggestion applies to the draftsmen. It seems superfluous to add that with such an organization, the engineer should be scrupulous in observing the proper method of giving orders and directions. Except where absolutely necessary, no orders should be given concerning any other matter than assignments to any one in the organization of a lower rank than assistant engineer, and in all cases all superiors of the person to whom the order is given should be notified as soon and as completely as possible. This is basic, but is disregarded so often that its inclusion here is justified.

Inspectors should be directly responsible to the engineer and should be assigned to, and should report through, the assistant engineers. There is no need with the organization that I have outlined for such a person as chief inspector. It is unfortunate that the custom of paying inspectors out of construction money is almost universal and that large inspection charges against small jobs are looked upon with scant favor by the authorities. Some of the smaller jobs are more in need of careful inspection than some of their larger relatives.

Fourth Essential—Satisfactory Quarters and Sufficient Equipment

The equipment of the city engineer is usually, as with his organization, inadequate. I have learned, when looking for a city engineer in a strange city, first to investigate the basement and, not finding him there, to skip all intermediate floors and seek him in the attic. I cannot explain this phenomenon, but can state it as a fact. Occasionally, an engineer is given adequate quarters. The engineer should have a private office to which he can retire for uninterrupted study. In addition, he should have a public office in which should be the desks of the deputy engineer and the secretary. It is in this office that all business should be transacted. No contractor or material man should be allowed under any consideration to force or worm his way into the private office. The public office should be supplemented by a waiting-room. This room, in order to economize space, may also be the public contact room to which plumbers come for sewer measurements and to which the general public comes for such information as is procurable only from the city engineer's office. There should be a general drafting-room equipped with at least two tables for each of the draftsmen. There should also be provided a smaller room that may be used for a drafting-room on special work and for a computation room. Ordinary principles of efficiency, to say nothing of humanity, require that drafting-rooms be properly lighted. The assistant engineers should each have a desk in a general office. The field force should never come to the general office, but should assemble in a room convenient to some exit. This room should contain lockers for the men and for the instruments. The rule of keeping the field men out of the general office should be rigidly enforced. On rainy days there is practically nothing that the average field man can do in the general office or in the drafting-room. Consequently, if he is allowed to remain in either of these rooms, he becomes a nuisance, hindering the work of other men and giving the public a bad impression as to the efficiency of the office. With definite quarters, the field men can be made responsible for certain of the less complicated records and for the care of the instruments and tapes, to the benefit of all concerned. This may seem an elaborate layout, but I feel that it is the minimum and that such a layout will pay for itself many times over in increased efficiency.

Transportation equipment is another debatable point. Personally, I believe that the city engineer should be equipped with a car for his personal use. The office should also have at least one car for every two field parties, unless it is considered advisable, as in Pittsburgh, to use taxi service in transporting the men from the office to their jobs and from the jobs to the office. It does not need elaboration to prove that rapid transportation to and from the job is good economy.

In the matter of instruments, there should be one transit and one level for each field party. In addition, there should be at least one of each instrument in reserve. I think that engineers tend to be over-elaborate in their choice of instruments. One of the levels and one of the transits should be fairly heavy instruments capable of the most exacting work. The other should be as light and as simple as the work will possibly permit. The heavy instruments, it will be found, drop very naturally into reserve. Certain special equipment, such as recording meters, flow meters, plane tables and the like, are necessary and should be added from time to time to the equipment. An engineer would do well to adopt a definite schedule for purchasing equipment, aiming to make each year certain definite additions to this special equipment.

Fifth Essential—A Complete System of Records

I wish something might be said that would adequately stress the need for records in a city engineer's office. So much of the engineer's work is for the future, so much is open for misconstruction, that adequate records are necessities, not luxuries. A job is not well done that does not leave a full and complete record behind it for the protection of the present and for the information of the future.

The first requirement in the line of office records is a general index to the information—all the information except the correspondence—that the office contains. Since the engineer's work is mainly in or along streets, the street is a most convenient basis for the index. This general index should cover all maps and plans; all field notes and construction memoranda; all ordinances, resolutions or reports of the common council having to do with construction work, street location, street grades, and all other matters of interest to the city engineer; in fact, all the information that the office possesses. The index should be, with the exception of the correspondence index, which will be described later, the only index in the office. There are offices that I have known where indexes were so plentiful that I have wondered how the engineer ever managed to get along without an index to the indexes. Three-by-five cards, with colors to repreesnt different classes of information, make the most satisfactory equipment. These cards, when filed back of guide cards, labeled with the names of the streets, give at a glance all the information that the office possesses regarding any particular street.

Before proceeding to any specific suggestions regarding the remainder of the office records, I want to impress one general observation on the minds of all. Uniformity in size and simplicity in form are two of the basic and absolute essentials of a successful system of records. It is far better to waste a little space or to crowd your information a bit in order to make all record forms of a uniform size than to adopt a different size and shape for every form. The need for simplicity is too well recognized for discussion. There is a third general requirement that may be considered somewhat subordinate to the other two. I refer to convenience in the size of the forms. Since fully half of the information consists in having it where you want it when you want it, I have come to the conclusion that a pocket-size sheet is best for all standard forms. This means some inconvenience in regard to typewritten work, but I feel that the inconvenience is much outweighed by the advantages.

Field notes are the most common and the most abused form of engineering records. More than 99 per cent of field notes are unintelligible, even to the recorder, after six months have elapsed. In the average office this condition is so well recognized that no one ever thinks of consulting "cold" notes. Field notes should be kept in a form prescribed by the office head and should be kept on loose-leaf sheets of the same size as those used for inspectors' reports. All general field notes should be filed in envelopes labeled with the street name. Field notes having to do either with the preliminary work, progress or final measurements of construction work should be finally filed with the inspectors' reports covering that particular job. Personally, I have a feeling that sudden death should be the penalty for any failure to properly label and date each sheet of field notes.

Maps and plans should be on uniform sheets of a convenient size. I have found that a sheet 21 x 30 inches is the most convenient. Such a sheet can be handled on the job and in the office with the least effort. In the matter of maps and plans it again seems better to do violence at times to the draftsman's idea of a proper scale in order to obey the dictates of uniformity. Where maps are made indiscriminately on scraps of paper or on sheets the size of a living-room wall, it is very difficult to file them properly. I believe it is safe to say that very, very few of such maps live to a ripe old age. Specifications are office records which are much neglected. Even standard specifications are, or should be, in a constant state of revision. This means that the specifications under which a paving job is done to-day might be considerably different from those used on a similar job last month or those that will be used next month. Consequently, it seems that the specifications under which a job is done should become a part of the office records and be filed with the reports. In my own pet system of records and reports the specifications were printed on sheets of the same size as the standard reports and at the close of the job were bound with the reports to make a complete record. I found that pocket-size specifications had another advantage. The inspector could carry them in his pocket on the work without the semblance of discomfort, and a decided tendency became apparent among the inspectors so to do. The tendency promoted to a considerable degree the reading of the specifications.

Reports are either disregarded entirely in the average municipal office or are kept with such scant attention to details and accuracy that they are of no practical value. I believe that a system of reports should be part of the city engineer's religion. In my own experience four types of reports were found desirable. First, a report was required from each of the employees of the office covering his daily work. These reports showed the nature and the location of the work on which each employee was engaged each day. They were originally intended to assist the secretary in distributing the time and in making up the pay-rolls. They were later found of considerable use in many specific instances. The second class of reports, and perhaps the most important, were those required from the inspectors on construction work. These reports were made fairly complete and covered not only the work done each day, but also such things as materials received, accidents, weather conditions, soil conditions, and force employed. The inspector was also required to note on each report any orders received by him either verbally or in writing. As argument-settlers these reports were without equals. These reports were supplemented by extra work reports and load reports. The extra work reports, I feel, were particularly interesting. Extra work is the "bugaboo" of construction work. It is safe to say that there is more damage done to perfectly good souls because of wrangling and prevarications over extra work than over anything else in which a city engineer is interested. We adopted drastic rules regarding extra work and then enforced them as drastically. No extra work was ever undertaken without a proper order. This order was made in triplicate, one copy going to the contractor, one to the inspector, and one being retained in the office. These orders were very explicit as to the work required. The orders were numbered continuously for each job and the inspectors were required to submit with their daily report an extra work report showing all labor and materials that entered into each piece of extra work in progress on his particular job. These reports were signed by the inspector and by the contractor. When the work was completed, the inspector returned with the last report his copy of the order. This informed the office that the particular item of extra work was completed. The cost was then computed and the amount included in the next partial estimate. With this system we had one argument over extra work in eight years. That argument was with an Italian contractor who rendered a bill for something over $700 for extra work covered by reports duly signed, showing a total of approximately $120. The contractor was paid $120 plus the usual 15 per cent and the "argument" was merely a one-sided lament.

Laboratory reports covering materials used on the work were also of uniform size with the other reports and were bound with the other data for final filing. With these reports and the other reports which I have described, it was possible on asphalt construction to trace a failure in any particular place in the street step by step to the plant and to the materials involved. We experienced some difficulty at first in securing reports from the inspectors at the proper time. This difficulty was overcome by notifying the inspectors that their pay-rolls would be made from their reports. This ended the trouble.

One point in which the records of an engineering office are woefully deficient, is a proper street record. Ordinarily, an engineering office can inform you where a sewer is located and can give you fairly complete "Y" locations. When it comes to the matter of street acceptances, street grades, street locations and street histories, it is entirely a different matter. After a mad search through the office the engineer will usually inform a citizen requesting any such information that it is not available. I believe that a street record as complete as the sewer records should be in every engineering office. Supplementing this street record should be a city map. This map, primarily devised for the city assessors, will be of more than passing use to the engineer. It will eliminate the need for about 90 per cent of the time-taking little survey jobs that raise havoc with the best-considered work schedule.

There is not much need to emphasize the sewer record. I do feel, however, that considerable value could be added to these records by indicating thereon the depth of the sewer. This is a question that is continuously being asked and which under the present and usual state of the records requires a delving into such musty and dusty records as may have withstood the assaults of time. Another failing with sewer records is the failure to tie in manholes.

I will conclude with a brief reference to the office correspondence. Correspondence is of two general classes—important and unimportant. Unimportant correspondence, such as requests for catalogs, testimonials regarding patented pavements and the like, should be immediately filed in the waste basket—some of them, I feel, without even being read. Important correspondence derives importance from two sources—the information contained or the name and address of the sender. When a letter is of importance only as a reminder of the name and address of some person or company, the name and address should be recorded in a proper book and the letter destroyed. It is only by constant weeding that the bulk of a correspondence file will be kept within reason. Where all correspondence entering or leaving the office is carefully preserved, the inevitable result is that important letters of a few years back are either lost or inaccessibly filed back of the coal-bin in the basement. Correspondence should be filed in groups of 20 or 30 letters, arranged as nearly as may be in chronological order. The letters should be numbered continuously and two cards, or more if necessary, made for each letter. One of these cards should contain the name of the person writing or written to, the number of the letter, the date, and a very, very brief synopsis of the letter's contents. These cards should be filed alphabetically. The other card should contain similar information, but should be headed by, and filed under the subject covered by, that particular letter. These cards should also be filed alphabetically. When a letter covers more than one subject, a subject card should be placed in the file for each such subject. If these subject cards are well cross-referenced, the city engineer need never fear a lost letter, since it is possible to locate the letter either by subject or by name. This system has been criticised and condemned because of the time required for making out the cards. After eight years' experience with such a system, I am willing to risk my hope of immortality on the accuracy of the statement that the time required for making and filing the cards will be saved ten times over by the facility with which letters may be consulted.

In the preparation of this paper, I have kept in mind not only the city engineer, but also the men who are charged with his appointment and the men with whom he comes into contact. If I have succeeded even in a small measure in showing how the engineer's work fits into the general working of the city adminstration, I shall be happy and shall consider that this paper has not been entirely in vain.

Efficiency in Garbage Disposal

A Civic Consciousness as Well as a Competent Engineer Necessary for Efficient Garbage Disposal

IN the report of the Committee on Garbage and Refuse Disposal presented to the 11th Annual Convention of the Minnesota League of Municipalities by W. F. Bleifuss, Health Officer, Rochester, Minn., several facts regarding conditions in Minnesota which are applicable in many other states are brought our forcefully. A general survey carried out a year ago showed that the collection and disposal of municipal refuse was not satisfactory from the standpoint of efficiency, sanitation or civic pride. It was not efficient because the collection was never complete, though in some cases it was done with outward economy. It was not sanitary because inefficiency in waste disposal always means that sanitary requirements are ignored; and as far as civic pride was concerned, no community was taking any pride in its rubbish heap. The survey showed that most cities were using dumps for all or part of their refuse. Garbage was usually collected haphazard by private collectors or disposed of individually. Several municipalities were using incinerators, others were filling in low lands with ashes and rubbish collected from the city. Very few communities were satisfied with their own solution of the collection and disposal problem, and most city officials were looking for something better.

Some cities evidently were displaying considerable ingenuity in hiding their refuse piles, but it is getting to be a difficult matter to hide anything from the traveling public. "A civic consciousness" that would make a dump at the door of a city as objectionable as though it were at one's private door seems to be needed. City officials keenly feel the lack of system in this form of municipal house-cleaning, but the general public seems to be indifferent. Probably the matter should be approached not from the public health angle, but from that of civic pride. The better individuals of our communities do not so handle the refuse question as far as their own homes are concerned, but perhaps more should be done to emphasize the inconsistency of permitting their municipalities to do so. Good ordinances covering refuse disposal are sadly lacking, or at least they are not effective because they not enforced. It is questionable whether a model ordinance would help, because local conditions differ and each community has a problem of its own.

The general management of this situation should be placed in the hands of the city engineer. It is a problem for engineers and police departments more than for boards of health. This leaves the health officer more time for things that really count in the prevention of disease. If the municipal health department's time is mainly taken up with matters which come under the general head of "nuisances," the department is fighting disease with a blunderbuss instead of a rifle. A study of progress in public health during the last quarter of a century will show that this statement is correct. From a public-health point of view, the important thing in refuse collection and disposal is to prevent flies from gaining access to such material as is suitable for fly-breeding. Garbage alone does not "breed" disease germs—it can't cause sickness except by helping to propagate flies. Even flies cannot cause disease unless they are permitted access to discharges from the human body.

How to Improve Garbage Disposal

Create a civic interest on the part of the taxpayers.

Put the management in the hands of the city engineer.

Carefully study the advantages of the different methods of disposal and don't jump at conclusions. Employ a competent, experienced consulting engineer to design and superintend the construction and operation of the disposal plant.

Municipal house-cleaning—literally—is being neglected. This is one reason why so many of our municipalities are not more attractive than they are. Some American city has yet to evolve a plan, and put it into operation, that will give general satisfaction for the disposal of all kinds of waste.

Disposal by Incineration

Incineration is to complete destruction of waste by burning. It has three distinct advantages: (1) single cans for houses, making it easier for the housewife in that there is no sorting, and this means complete collection of all refuse; (2) reduced cost of collection because an incinerator can be centrally located; (3) it is thoroughly sanitary because it destroys all organic or germ life.

There are not many disadvantages in incineration. The best plants have a fairly high initial cost and a little uncertainty as to how the plant will operate under all conditions. Also, if not operated properly, there is some chance of escape of offensive odors from the smoke-stack. Except in large cities, there is little or no opportunity for profit from the sale of by-products. Since garbage has a high food value, incineration of this form of municipal refuse means a total loss as far as food conservation is concerned.

In a study of incinerators in general, the Minnesota Committee has been impressed with the fact that not everybody can design and construct a successful incinerator. Anybody can burn rubbish, but to design an incinerator that will burn all rubbish, from dead animals to wet garbage, and that is just suited to the needs of the municipality, is a difficult thing to do. The wise city engineer usually will be glad to call in a consultant, and this consultant should be one who has had experience in constructing just such a plant.

The fact that an incinerator totally destroys all refuse, leaving practically nothing but ashes, nothing to cause offense which will make Mr. Citizen rush to the Board of Health to complain of a nuisance, is much in its favor. It does not have to be put up in a lonely, distant spot or hidden from sight. It is possible to construct it so that it may be pointed out to sightseers as one of the attractions of the city. Some municipalities have made their incinerators very attractive by covering them with ivy, as though they were libraries or churches.

To burn refuse, it is necessary to have a hot fire with a temperature of over 1200 degrees. The fuel is not coal. Some waste, such as garbage, contains much water. When dried, however, it has considerable calorific or heating value, which is equal to about one-half that of coal. Even ashes contain as much as 25 per cent of unconsumed coal, rubbish is 95 per cent combustible, and street sweepings contain 25 per cent of combustible matter. From this, it is seen that there is plenty of material in mixed refuse to furnish combustion. It will burn if the moisture is first driven off. Incinerators, of course, are constructed to dry the wet refuse first before any attempt is made at combustion. A good incinerator burning ordinary mixed refuse requires little or no extra fuel, as the readily combustible rubbish will provide the heat.

Municipal refuse is not the same for all localities. Here there is a certain proportion of garbage, for instance, and there another proportion. The failure of incinerators to operate successfully is due to faulty design, which causes incomplete burning. Many incinerators throughout the country have been built and operated for a time and then abandoned. Sometimes, it is true, they were abandoned for no other reason than that there was a change in the city's administration, but usually it has been because of some fault of construction or operation. They did not fit the incinerators to the town, but built an incinerator and then tried to fit the town's refuse to it.

A well-known engineer has said that it is perfectly possible to cremate all refuse, providing a proper study is made of design and operation. He advised specifications for construction, the same as for other municipal works, with complete instructions to bidders as to just what the requirements and conditions are. No municipality should think of constructing an incinerator without first making a study of the whole situation; it should know how many tons of refuse it has per day to be disposed of, what the composition of the refuse is, the percentage of moisture and the percentage of combustible matter. The firm building the incinerator should guarantee the proper operation of its design both for efficiency and economy.

Know Your Mains and Valves

Abstract of a Report of the Committee on Fire Prevention and Engineering Standards of the National Board of Fire Underwriters

ONE of the most interesting passages in a recent report of the Committee on Fire Prevention and Engineering Standards of the National Board of Fire Underwriters describes broadly the conduct and results of engineering surveys of municipal water-works. These surveys are conducted from time to time in different cities to determine the grading of cities for fire insurance and are particularly helpful to municipal officials in unearthing conditions which have not been noted by the officials of the department responsible for them.

"In the course of the investigation of water-supply and distribution in different cities, the National Board's engineers frequently uncover conditions which were unknown to the local authorities. It was found in a certain Michigan city, for example, that the hydrants on one side of the main business street gave forth a copious supply of water, whereas on the other side the flow was deficient. An inspection disclosed the fact that the sub-normal hydrants were connected to a main on which the gate-valves opened in a direction opposite to that usually employed, and had been tightly closed when they were supposed to be open. The water department had no record of this condition, and the result of the discovery was an ample supply of water at good pressure from all the hydrants in the mercantile district.

"Fire-flow tests are conducted at various points in a city, a number of hydrants being opened simultaneously so as to counterfeit the conditions that prevail during a large fire. Instruments are used, of course, to determine the actual flow of water. The result of such a test has often convinced city officials of the inadequacy of the local water-supply.

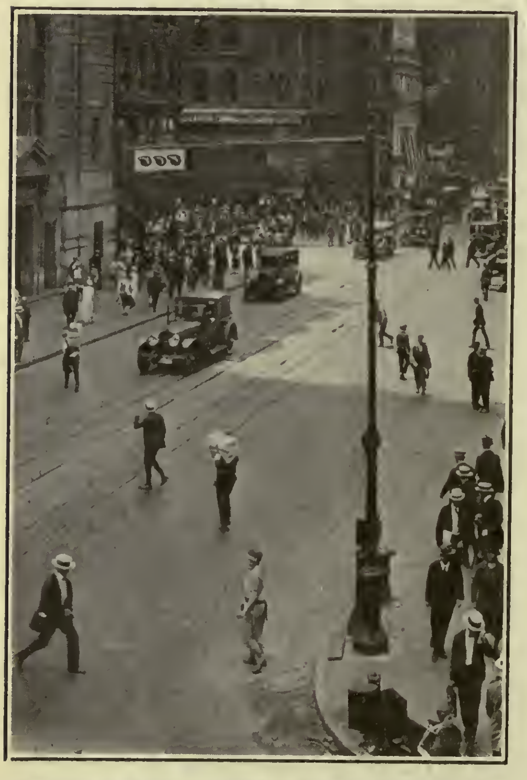
"A brief review of the developments of recent years that have affected the whole problem of fire control will be of interest. During the two war years, 1917 and 1918, and in some cases during the two succeeding years, there was a decided falling off in fire protection improvements in all of the city departments having to do with this important function of municipal work. Even maintenance work and the ordinary extensions stopped or were greatly curtailed in the water-works field.

"Beginning with 1922, officials of the water departments began to realize that there was little immediate prospect of a decrease in cost of materials or of labor and that therefore plans must be made for the immediate needs of the city, to take care of the future. In a large number of instances, operating costs had increased to such an extent that no funds were available and bond issues or increase in water-rates had to be adopted. The year 1923 has shown an increase in the amount of work. Certain cities, such as Akron, Detroit, Bridgeport, New York, Los Angeles and some of the smaller industrial centers, were forced even during the war years to undertake a large amount of work, and these cities and others are now completing or have already completed very extensive improvements."

New Traffic Control System on Broadway

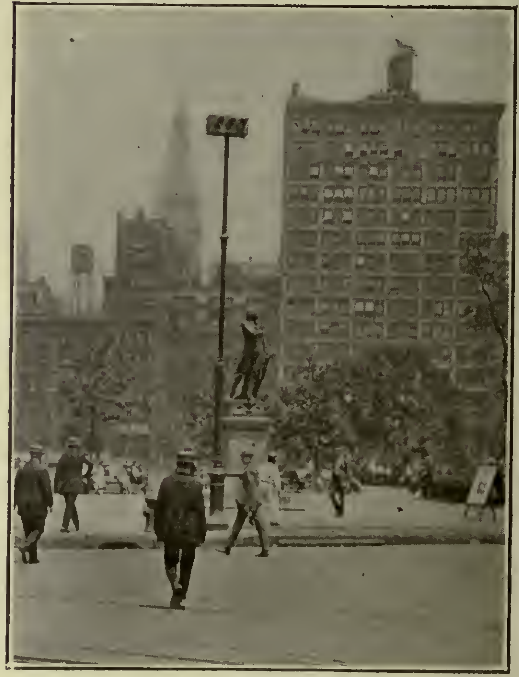
THE first installation of considerable size employing the suspended type of traffic signals is helping to solve the congestion problem of Broadway, New York, from Rector Street to 86th Street. Structures like those in Fifth Avenue could not be used. Instead, it was necessary to suspend the lights on ornamental brackets on poles along the curb, 6 feet out from the curb and 24 feet above ground.

The control lights are visible for several blocks, even in bright daylight. The units, with their red, amber and green lights, are placed at intervals of four or five blocks in the down-town section, and eight to ten blocks in the up-town section. The installation includes 21 two-way and 6 single-way units; the single-way units are used on the north and south sides of the elevated structures.



TRAFFIC CONTROL SIGNAL AT BROADWAY AND VESEY STREET, NEW YORK CITY

Traffic movement can be synchronized, or each signal can be operated independently, thus giving right of way to meet emergency conditions. Traffic in Broadway moves a minute and a half; cross-town traffic 40 seconds. Vehicles in cross-town streets govern themselves by the traffic in Broadway, the lights not being visible in those thoroughfares.



SPECIAL BRACKET TYPE TRAFFIC SIGNAL USED AT UNION SQUARE, NEW YORK CITY

All of the signals are used through the day, but after 6:30 p. m. only the section between 23rd and 86th Streets is included in the operation of the system.

The signals are made of heavy copper stock, with visors above the lenses to cut out the direct rays of the sun. The glass reflectors are silver-plated and protected by a flashing of copper, thus insuring long life to the reflecting surface. Behind each lens there is a 50-watt, 110-volt mill type filament incandescent lamp.

The order for these special traffic signals was placed with the General Electric Company three weeks before the Democratic Convention opened. Exceptionally heavy traffic was expected at that time, and the order was given right of way at the Lynn works of the company. The signals were delivered two days before the convention opened. They are proving their worth both for emergency and ordinary traffic conditions.

City Manager Charters Analyzed

Part I: Historical Background—Variations in Plan—Legislative Body—Proportional Representation—Qualifications for Councilman—Mayor

By Wylie Kilpatrick

Director, Hoboken Bureau of Municipal Research

THE city manager form of government completed its first eleven years of history on January 1, 1924. Eleven years previous, Sumter, S. C., the first city to inaugurate the manager form, began operation under a charter adopted in 1912. Staunton, Va., it is true, began operation under a "near manager" plan in 1908. By a local ordinance of that year Staunton created a managerial position which she superimposed upon the mayor-and-council form prescribed by the Virginia constitution. The Dayton charter, ratified August 12, 1913, went into effect the first of the following year. The pronounced success of the managerial plan in Dayton came at a time when enthusiasm for commission government had suffered from various failures in practice, and cities desirous of altering their charters watched the Ohio city with interest.

A Study of 166 Charters

To take stock of the city manager plan as expressed by the charters of the manager cities has been the object of an exhaustive analysis by Dr. Robert T. Crane, Director of the Bureau of Government of the University of Michigan.[1] The framework of 166 municipalities is minutely analyzed in his digest of manager charters, which limits its scope to an examination of charters and omits ordinances which establish the managerial form. For the data upon which this article is based the writer is indebted primarily to Dr. Crane.

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[1] Digest of City Manager Charters ($5.00). National Municipal League, 261 Broadway, New York City.

The charters of the city manager municipalities throughout the United States have in the main been modeled on the early experiments. Eleven years' growth in the movement, however, has thrown up variation in the plan; adaptations have been made to local conditions; twists have been made necessary by state laws.

Historical Background

The assumption is commonly made that the city manager plan is a direct outgrowth of the commission form of government. The very frequency of the use of the term "commission-manager" implies that the manager has been merely grafted upon the commission so that the resulting hybrid is but a judicious mixture of plans. In fact, certain essentials of the manager form strike back historically to the earliest forms of municipal government in America. Complete centralization of executive and legislative power in the city council—an essential of both the manager and commission forms—marked the structure of colonial municipalities.

The democratic origin of the practice of separating the powers of a city government, or rather the Jacksonian interpretation of democracy, should be fully understood to-day. It stands in the way of the full acceptance of a workable plan to ensure democratic control of city officials and is responsible for many of the curious twists to which present-day machinery of local government is subjected. Although the framers of the Federal Constitution thoroughly exploited the dogma of the triune nature of government in 1787, the theory was not accepted by municipalities until the Jacksonian fervor for popular sovereignty toppled over the practice of centralizing power in a legislative body which was responsible for administration through selected agents.

The mayor was the first to be cut off by a popular election from the control of the council. Complete separation of powers was accomplished by making the various heads of the city subject neither to the mayor nor to the council but to popular control. The long ballot of the city resulted from the belief that the number of officers elected by the people was an accurate measure of the extent of democracy; it did not result from a deliberate decision that a sharp distinction should be made between legislative and executive functions.

The gross mismanagement which marked American cities fifty years ago did not suggest a return to centralization of power to the framers of city charters. Rather, one executive, the mayor, as a substitute for many popularly elected administrative heads, was resorted to by many cities. Here, then, we find a development which necessarily preceded the city manager plan. The strong mayor type did this important thing: it acknowledged the natural division between policy-making and policy-executing functions and it centralized to a large extent in one administrator the responsibility of execution. It is true that this distinction was hardly ever drawn accurately, for the mayor was frequently given a degree of legislative power. Yet the distinction did exist in the rough and prepared the way for its more precise definition by the manager plan.

The city manager form, based as it is on the theory of the colonial type that executive and legislative responsibility must be centered in the council, avoids the error of the commission plan in requiring legislators to perform the detailed administrative work of an executive. A dual requirement emerges: centralize power and responsibility and distinguish between policy-forming and policy-executing functions. These seemingly conflict and an impasse is reached until the manager form recognizes that all policy-making functions can be centralized in a popularly chosen council to which a single administrator is responsible for policy execution.

The managerial plan is indebted to commission government for recalling to American practice the historical basis of centralizing responsibility in the council; it is equally indebted to the strong-mayor type for proving the value of a single-headed administrator. It avoids the error of the former by distinguishing between policy-making and policy-executing duties; it eliminates the mistake of the latter by placing executive responsibility in the council, and administrative execution in a manager accountable to that body.

Variations in Plan

An examination of present-day city charters reveals to how great a degree the managerial conception has found acceptance and to how large an extent it has been distorted in modified plans of hybrid forms of local government. The ordinance-created manager (eliminated from consideration in the Digest) is a common method by which the manager plan is distorted. Though it may establish a genuine city manager form and lack only the sanction of a charter, it often is merely a hybrid. The "gland operation" is accomplished by imposing the managerial office upon a federal or commission structure. The manager of this type in many instances has gone out the same way he entered—by ordinance.

Dr. Crane's digest is in the main confined to genuine city manager plans in which the council holds a single officer accountable for the city's administration. Yet the inclusion of a number of doubtful cases where some fundamental principle is lacking makes it necessary to distinguish between the genuine and modified types of the plan. Diffusion of administrative responsibility, the subjection of the manager to popular recall, and possibly the omission of the popular checks through the initiative, referendum, and recall, are various perversions of the plan found in some municipalities.

Legislative Body

A council and not a commission is the legislative body of the city manager plan. It has complete legislative and executive responsibility, exercising its legislative powers directly as a deliberative body and its executive functions indirectly through an appointed manager. A commission, strictly speaking, is composed of a group of administrators who periodically assume legislative duties when joint action is desirable. The hybrid term "commission-manager" is entirely misleading, for to create a city manager is to make impossible the functioning of a commission. The absurdity of confusing or coupling the manager and commission plans is apparent when we attempt to join these terms which neutralize each other. Though occasionally the representative body is named "board of aldermen," "board of trustees" or "directors," the words "council" and "commission" are used in 141 of the cities. Commission is the title in 73, a number slightly in excess of the term "council," found in 68 charters. It is apparent that the word "council" is increasingly employed, for of the 42 cities adopting manager charters in 1921 and 1922, 25 designated their legislative body as a council.

Larger councils are provided in charters lately adopted. With the growing realization that the council is a deliberative body and not a group of administrators, the norm of the commission plan—a group of five—is being abandoned. The size of the group in the commission plan is gaged by the number of administrators; the size of the managerial council corresponds to the local needs for a deliberate body of legislators. The effect of the commission type is still pronounced, for in more than half of the 167 charters five councilmen are provided. An even smaller number, three, is found in nearly a fourth of the charters. The growth of the larger chamber, however, is shown by the fall in the percentage of councils with five members or less, from 100 per cent in 1913 to 78 per cent in 1922.

Non-partisan nomination of councilmen and their election at large is the usual procedure, although there is a surprising number of cities which retain the partisan nomination or some feature of ward residence as a qualification for the council. Nomination through a non-partisan primary or petition is provided in 103 charters. Although a confusing variety of election methods prevail, the principle of election at large is accepted in 126 cities. Only 37 charters require a ward or district residence as a qualification for a councilman; 19 of this number require the nomination to come from the district, and nearly all of this number, 15, add ward election to the nomination qualifications.

Methods of election affecting the personnel of the council are recognized as having an important reaction, if not a deciding influence, upon the administrative service. The council must continue to control the character of the administration, not by directing subordinates but by acting upon the manager. Colonel Roosevelt in the heat of a campaign once said of his opponent: "He means well but he means well feebly, and he is surrounded by men who neither mean well nor are feeble." If a group of strong, self-willed politicians compose the council, non-partisan administration will be jeopardized; if a manager whose tenure is necessarily dependent upon the pleasure of the council gives way before aggressive partisanship, a political ring can as effectually control administration as in any other form of government.

Admittedly, the particular mode of election —whether by ward, at large, or by another device—is not fundamental to the manager plan. But the trend in practice can be readily discerned, and possibly the next step can be forecast. The city ward was discarded by most of the charter-framers as an unnatural political unit. It represents nothing more than the "sleeping-quarters" of a particular group whose vital interests may be, and often are, elsewhere in the city. Whatever may be claimed or denied for selection at large, it does eliminate gerrymandering, aptly defined as the art of arranging the lines of districts so that a majority party elects only a minority of legislators.

Proportional Representation

Other measures are now being tried to eliminate the dextrous log-roller and his pork barrel. For, too frequently a city under the election-at-large method finds that instead of "seeing the mind of the city in the council in miniature, it really sees it in caricature." The preferential ballot has been adopted in fourteen cities, though the use of it is decreasing.[2] Of more significance, however, has been the introduction of proportional representation into the charters of Cleveland and Ashtabula, Ohio, and Boulder, Colo. Representation of powerful minorities on the council, made possible by this mode of election, is possibly the best safeguard against an extra-legal machine willing or anxious to emasculate the manager plan. Even a temporary reaction which gives the old-line candidates a bare majority will not be serious when the council contains a strong minority watching every move of the controlling faction.

No experiment in governmental machinery will be watched more closely during the next few years than the operation of proportional representation in Cleveland. The character of the legislative body has been one of the chief obstacles in the past to the introduction of the manager plan into the larger American cities. The customary-sized council of five can not be truly representative of a huge city. To increase the number appreciably would destroy the high visibility of the short ballot and substitute one as long as a wet blanket. Reversion to the ward system, even though it would avoid the confusing long ballot, is unthinkable after its admitted failure. Chester C. Maxey points out that both the long ballot and the ward system are obviated by the Cleveland method of proportional representation. If, in fact, the recently elected council of twenty-five in Cleveland proves to be a body honestly representative and non-partisan, a most powerful stimulus will be given to the adoption of the manager plan in the major American cities.

Qualifications for Councilmen

The conception of the council as a deliberative legislative body and not an administrative group, is reflected in the qualifications and salaries specified in the charters examined. No salary, or the nominal one of a dollar a year, is the compensation fixed for members of the city council in 34 cities. Although salaries of $1,200 are frequently paid, the weighted average per year is $200 dollars.

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[2] Alameda, Calif.; Santa Barbara, Calif.; Colorado Springs, Colo.; Grand Junction, Colo.; Decatur, Ga.; Alpena, Mich.; Big Rapids, Mich.; Cadillac, Mich.; Manistee, Mich.; Sault Ste. Marie, Mich.; Morris, Minn.; Mangum, Okla.; Le Grande, Ore.; Tyler, Texas.

The charters of 43 cities, it should be noted, fix the compensation according to the number of council meetings attended.

Qualifications for councilmen as to age and residence, hardly significant in themselves, differ widely. Any financial interest in city administration which may prejudice the conduct of a councilman is guarded against by various forms of disqualification. One, an interest in municipal contracts, is contained in nearly all the charters. Dr. Crane concludes: "The total lack of anything approaching to a consensus of opinion on most of the tests justifies the conclusion that the right to vote in the locality is a democratic and sound and sufficient qualification for members of the council."

Mayor

What position does the mayor assume under the manager charters? Caught between the upper- and nether-stones of executive responsibility of the council and administrative direction of the manager, his powers and title are anomalous. Primarily, he is the presiding officer of the council. One hundred and forty-six charters cast him in this role. Although the presiding officer, he is given a vote, in all charters, with the exception of Bay City, Mich. The denial of the veto power comes as a natural consequence. The mayor retains the emergency powers which have historically been given his office. In an emergency, as a riot, he assumes the powers of a sheriff and takes over the direction of the police. Although this power is specifically granted in only 49 charters, it is a common law prerogative of the mayor which is not withdrawn by lack of expression in the other charters.

That the exact status of the mayor remains somewhat unclarified is indicated by the mode of his selection. The hereditary conception of the mayor as a direct representative of the people continues in 50 cities which provide for direct popular election. The more common method, prevailing in 98 municipalities, is that the council shall choose the mayor from among its own members. An additional seven specify that the mayor shall be the candidate for the council receiving the largest vote. Significantly, the majority of the charters refer to the mayor in terms that imply that the traditional idea of his office has not been abandoned. He is named as the official head of the city by fourteen charters, chief executive by thirteen, and ceremonial head by one charter. These references may be interpreted either as a hang-over of an obsolete idea, or as the retention of a fundamental idea which will find more adequate expression in later charters. Dr. Luther Gulick, commenting upon this aspect of the manager plan, said:

> "It is human nature for voters to demand some one individual to stand up as their political leader and public educator on matters of municipal concern. There must be some one man in the community who not only can talk for the public, but can help them see their way out of the morass."

City manager charters indicate that this criticism has been unconsciously felt and that charter makers are sensing the need for political leadership. Both the number of popularly elected mayors and the recurrence of references to the mayor as the head of the city lead to the conclusion that the people desire a chief officer directly responsible to them. Possibly, the development of the manager plan in the next decade will throw up the mechanism to meet this need. If the current conception that the mayor is essentially a moderator of the council is to prevail, the American city will contribute a counterpart to that sinecure of national life, the Vice-President. The mayor will then second the frank confession of Thomas R. Marshall: "I hate to work. I wouldn't work if I didn't have to. I hate to work so much I'd like to be Vice-President again."

(*To be concluded in the November number*)

Americanization Through Community Music

HERE is the personnel of a community band in Luzerne County, Pennsylvania: Peter Muscovitch, Herman Bressler, John Fetchko, Philip Galdon, Henry Houser, Stephen Cimbala, Andrew Yanchko, Joseph Washko, Max Rossi, Stephen Fulton, Michael Prokop, Elsworth Minnich, Albert Toreson, Frank Sheminsky, Neil Organ, Joseph Yamulla, Andrew Puhak, Frank Dushanko, Howard Spade, Bernard Lapinski, James McElwain, Elmer Gardner, James Hall, Frank Cervasio, John Tychinski, David Renshaw, Joseph Cortese, Morton Baskin, Michael Burchak, Thomas Arey, Vincent Boyle, William Crabtree, John Sellers, Michael Danay, Leo Moore, David Zillig, George Haswell, Adam Sabatella, Wassil Smerekanich, Adolph Sheminsky, Stephen Fekety, George Yurick, James Angelo, George Rusnock.

"A Friend of the Editor," who sends this list to the *Journal of Education*, writes: "Is Americanization work being done? It surely is, and best by those who talk least about it, but who do it without any formal and forbidding courses. The above is the personnel of a band in a Luzerne County, Pennsylvania, High School. The foreign proportion runs about the same through the community, yet it is a safe bet that pure, disinterested patriotism and real unpaid Americanism is just as high there as it is in the United States Senate—but there isn't as much noise and flag-waving—or job-grabbing—about it."

ONE OF THE COMMUNITY PLAYGROUNDS IN THE COUNTRY CLUB DISTRICT, KANSAS CITY

Suburban Subdivisions with Community Features

Suggestions for Realtors and Community Organizations, as Exemplified in the Country Club District of Kansas City, Mo.

By J. C. Nichols

DEVELOPING suburban subdivisions with community features is a subject of constantly increasing importance to the real estate profession. Community features may be largely instrumental in first attracting the attention of the buying public to a subdivision. They may be the factors that largely create sales in the beginning. Community features can be the means of giving character and distinction to suburban property; the things that create enthusiasm for the property by its residents; the things that cause the tenants and owners in the property to enjoy living there.

Recreation for the Community

An annual community field day—bringing together all the school children in the district—can be made inexpensive and very effective. For several years we have held such events in the Country Club District of Kansas City, largely underwriting the expenses of the meet. In May of this year we had approximately 3,000 school children on the campus of one of our private schools. Eleven schools, public and private, some of which reach only partly into our district, joined in the meet. An executive committee was composed of a representative of each school. All the events were carefully worked out in advance—each school having its own individual feature event, and also entering representatives in the general events.

And then again we have our hikes into the country—perhaps a "wienie" roast for the boys of a certain school. We may get a lover of birds to lead the boys, a geologist, or someone interested in the early history of the territory to make the trip interesting. Trails for hikes may be provided, particularly if you have an interesting country around. And the more adventuresome these trails become, the more interest they have for the grown person or child that loves to walk in the woods. We built six picnic ovens at various points along the trail, which are used morning, noon and night by those who love the outdoors and enjoy a meal in the open, cooked over the picnic fire.

Other recreational and cultural features include a supervised playground; a community hall, where neighborhood dancing lessons, lectures and community events may be held; neighborhood flower shows; community Christmas trees, and the singing of Christmas carols as a community activity; the encouragement of horseback riding and of bicycle clubs; and an organization of boys to keep the snow swept from ponds or streams for skating in the winter.

We have four golf clubs in the Country Club District. Three of them we have built as an adjunct to our real estate development, organizing, financing and developing the club from the beginning. In two of these organizations it is stipulated that no one can become a member unless an owner of property in our subdivisions. We generally provide a site for the course without any charge, on our unsold acreage in the beginning. We start the dues at, say, $30 or $40 a year, with no initiation; provide no club house, simply a little room for golf headquarters; and start out with 9 holes, adding others as the club grows. We may have only 50 or 60 members to start on, but as interest grows and the membership increases, we have found from experience that within three or four years we shall have 300 or 400 members in our club. When it has grown to a strong membership, a club generally begins establishing a sinking fund for the purchasing of its own real estate for a permanent course and the erection of a complete club house. These organizations have been able to reimburse us for the amount of money we advanced during the early period, and their value to us has been well worth the giving of the ground without rent during the formation years.

GASOLINE FILLING STATION

COMBINED FIRE AND POLICE STATION

Community Homes Association

In every subdivision we have developed for many years, we have stipulated that the owner of each lot be obligated to pay not to exceed a mill per square foot per annum towards the organization and maintenance of a community homes association. This tax rests upon all unsold as well as sold sites. It is a tax on land, and not on improvements. Only residents can serve as directors, and without salary. It is an honor to be elected. An annual meeting is held of all the owners and the policy is prescribed, which the directors carry out.

Snows are cheaply plowed from the streets and walks, at a cost of only a few cents to every 50-foot lot. Street trees are sprayed and trimmed at a far less cost than the individual could do it, even if he would; and we know from experience, that if left to the individual owner, his street trees are generally neglected. Vacant property is kept cleaned and mowed as a community expense; shrubbery, flowers and ornaments in all public places are maintained; street trees are replaced when necessary; trash is hauled away at community expense once a month from each home. This waste-removal service alone would otherwise cost the individual owner more than his entire expense of the community homes company assessment.

The directors of this homes association are also charged with the responsibility of enforcing restrictions—and have the funds to go to court, if necessary. They take over the control of any playgrounds, fountains, picnic ovens, or other community features. They become a united, powerful organization to present any cause to municipal authorities, or to any public utility. They develop a strong community feeling, a neighborhood pride and a betterment of the physical condition as well as the community spirit of the entire section.

A GROUP OF HOUSES IN THE COUNTRY CLUB DISTRICT

Architectural Standards

Stores and shops in a real estate subdivision should be of good architecture, not offensive to the surrounding home owners. All loading and unloading of trucks should be confined to courts in the rear. No overhanging signs or big lettered posters should be permitted. No ugly or filthy rear ends should be tolerated. Filling stations can be made unobjectionable, if proper control of design, color and maintenance is retained.

The design and location of the fire and police station is important and should be made inoffensive. Of course the location of schools, with ample playgrounds, and the distribution of churches and structures needed to meet community needs, are important factors in community development.

Another important factor is the giving of character and distinction to certain neighborhoods and certain streets by a particular type of development. This may be done by the grouping of buildings of harmonious architecture; by a pleasing blending of the colors of the roofs of near-by houses; by the careful graduating of grade and floor elevation of one house with another; by the avoiding of the overshadowing of low houses by tall ones. Much charm in a residence neighborhood may come from the placing of interesting gateways at street intersections, but this is frequently abused in making the gateways the predominant thing, rather than incidental and subordinate to the streets and lawns themselves.

The curving of the streets, the placing of the trees, the planting of the shrubs, the walk design, and the various street furnishings may all be so arranged as to give a variety of character to various parts of a subdivision. Frequent triangular parks at street intersections give a cosy, domestic character to a residential street. They relieve monotony, they break the sweep of winds, they relieve the hot glare of a straight stretch of paving, they give ever-changing color and create a street scene of value to the entire neighborhood.

And then the realtor or the community association may go further and introduce certain ornamental features of good design and taste, appropriate to public sites. It may be

STREET-CAR SHELTER

BUSINESS DEVELOPMENT

TREATMENT OF STREET INTERSECTIONS

an interesting piece of statuary of real value and character, or a good reproduction obtainable in terra cotta and other factories. It may be a beautiful vase placed in an open park. It may be an interesting iron gate at an appropriate place; or it may be a fountain of local design or gathered from the markets of the Old World where such an abundant offering is obtainable.

The Opportunity of the Realtor

In the development of community features there is a great opportunity for the realtor. He is the man who creates and fixes the appearances of a city. It would be foolish for idealism to carry beyond the things that would pay. But as the realtor develops his properties and as the public appreciation will justify it, better and better community features may be successfully added. The community spirit will reflect itself in the architectural design of every home, in the garden side as well as the street side of the lawn, in the interior arrangement; hangings, paintings, and furniture of the owners, and in the mental attitude and spiritual attitude of the residents themselves.

Children will become interested. They will develop an art appreciation in the broad sense. They will become observant of the beauty of this great world around us. They will see greater beauties in the sunset, in the distant haze-covered hills. They will get a greater joy in the budding of the forest trees in the spring. They will be more thrilled by the singing of the birds in the early morn in the trees around their homes. They will gain an understanding of the miracle of the opening flower in the joyous springtime. They will learn to abhor ugliness and prize beauty. They will learn the value of good design in every physical object that exists. They will appreciate color harmony in our schools and homes, the streets and the public buildings. Their eyes will be lifted beyond the more sordid things in everyday existence, and they will begin to dream dreams for the future achievement and beauty of their city.

How Cities Use Their Land

THE following table appears as an appendix to "Elements of Land Economics," by Richard T. Ely and Edward W. Morehouse, recently published by the Macmillan Company, New York. A foot-note states that the table has been compiled by H. B. Dorau, of the Institute for Research in Land Economics and Public Utilities, from returns from questionnaires sent to various city officials; and that these figures represent the best estimates available, but, although they have been carefully edited, they cannot be guaranteed as absolutely accurate.

PER CENT OF TOTAL LAND AREA DEVOTED TO VARIOUS CLASSES OF USES IN SIXTEEN CITIES, 1923

	Publicly Utilized Area				Privately Owned Area				
					Unimproved	Improved			
	Total	Streets and Alleys	Parks	Miscel.	Total	Total	Residential	Commercial	Industrial
Columbus, Ohio	36.1	27.0	2.0	7.1	3.3	60.6	32.9	12.1	15.6
Davenport, Iowa	18.7	14.5	3.7	.5	36.8	44.5	42.7	1.2	.6
Detroit, Mich	30.0	25.0	4.0	1.0	14.0	56.0	33.5	4.5	18.0
Duluth, Minn	32.9	26.9	5.0	1.0	64.1	3.0	1.8	.2	1.0
Flint, Mich	22.4	16.5	2.3	3.6	21.3	56.3	52.8	.5	3.0
Knoxville, Tenn	22.8	21.1	.9	.8	17.7	59.5	48.5	1.9	9.1
Lynchburg, Va	18.7	13.2	2.8	2.7	13.5	67.8	50.8	10.2	6.8
Minneapolis, Minn	32.3	20.3	10.9	1.1	22.8	44.9	36.3	1.5	7.1
Norfolk, Va.†	36.2	23.3	2.4	10.5	9.5	54.3	33.4	2.5	18.4
Oak Park, Ill	34.3	32.5	1.4	.4	9.2	56.5	49.8	6.5	.2
Portland, Ore	25.1	20.8	2.7	1.6	18.7	56.2	42.1	5.6	8.5
Salt Lake City, Utah	28.2	16.7	3.1	8.4	33.4	38.4	36.6	.5	1.3
San Francisco, Calif	35.1	22.3	6.2	6.6	26.7	38.2	32.7	3.3	2.2
St. Paul, Minn	25.7	20.3	3.0	2.4	41.1	33.2	26.1	1.3	5.8
Toledo, Ohio	28.6	19.2	5.4	4.0	22.3	49.1	27.3	1.7	20.1
Tulsa, Okla	23.9	22.0	1.9	*	8.0	68.1	56.3	8.0	3.8

*Extensive parks and other public lands outside city limits.

†Excluding 7,500 acres recently annexed but undeveloped as to streets, parks, etc.

Standardized Empowering Ordinance for Highway Traffic Regulation

Suggested by William Phelps Eno

Chairman of the Board, Eno Foundation for Highway Traffic Regulation

An Ordinance[1] *for the Regulation of Highway Traffic in the City*[2] *of ....*

Be it ordained by the city of ....:

DEFINITIONS—That when used in this ordinance:

(a) The term "mayor" means the Mayor of the city of ....;

(b) The term "general regulations" means the C. N. D. (Council of National Defense) Code which at the time of its promulgation was officially designated as "The General Highway Traffic Regulations with Safety Directions for Drivers and Pedestrians,"[3] and which was adopted for standardization as a police code by the Council of National Defense, May 8, 1919, and revised to March 15, 1924;

(c) The term "special regulations" means those regulations which, in addition to the general regulations, are necessary to facilitate and expedite the safe movement of vehicles and pedestrians on the highways by the use of traffic officers and traffic guides;

(d) The term "traffic guides" means signs, limit lines, standards, "mushrooms," "turtle-backs," dummy cops, traffic "beacons" and "lighthouses," semaphores, "crow's-nests," traffic regulation lights, reflecting signals, sirens and such other devices as may be of assistance in the regulation of vehicular or pedestrian traffic.

Comments Are Invited

As a step in the direction of much-needed standardization, The American City is glad to have the privilege of giving first publicity to the accompanying draft of a proposed Empowering Ordinance for Highway Traffic Regulation, just completed by one of the world's leading authorities on street traffic control.

Comments, or suggestions for possible improvements in the ordinance, for publication in future issues, will be welcomed.

SEC. 1.—That the Mayor acting through the Police Department of the city of .... is authorized and directed to adopt and enforce the general regulations (with duly authorized revisions from time to time) and to cause them to be printed in a 4-page folder with pages 4 by 6 inches, on durable bright yellow paper, and also on a heavy yellow cardboard placard, setting forth all the provisions of the general regulations and no other printed matter.

SEC. 2.—That the Mayor shall provide that each uniformed member of the .... police force shall, when going on duty, have in his possession at least five copies of the general regulations, in folder form. Such member shall give one of such copies to any person violating any provision of the general regulations, marking on such copy the provision violated.

SEC. 3.—That the Mayor shall make effective arrangements for the furnishing of copies of the general regulations to any person on application to the Police Department and for the furnishing of copies of such regulations to every pupil and teacher in the public schools of the city of ....

SEC. 4.—That the Mayor shall cause the general regulations in placard form to be displayed at police headquarters, fire stations, public schools and garages, gasoline stations and in or on other available public buildings, or on standards, on the highways, in squares and parks, in such manner as to inform the public, including pedestrians, of the provisions of the regulations.

SEC. 5.—That the School Board of the city of .... shall by order of the Mayor provide for instructing the pupils of the public schools in the provisions of the general regulations and for such examinations and drills at such times and places as will cause such pupils to become thoroughly familiar with the provisions thereof.

SEC. 6.—That the Mayor is authorized to create a bureau in the Police Department to be known as the Traffic Bureau, which shall be in charge of a special officer who shall be known as the Traffic Director of the city of ...., and who shall not be under orders of, or responsible to, any officer below the rank of Chief of Police. All members of such bureau, or other members of the police force when detailed on traffic duty, shall be under the control and direction of the Traffic Director. Such bureau shall have control, subject to the approval of the Mayor, of the making and enforcing of "special regulations" in regard to moving and standing vehicles and pedestrians on the highways, and shall keep a record of accidents for the purpose of fixing blame and ascertaining cause, with a view to devising prevention.

SEC. 7.—That the Mayor may in his discretion cause to be compiled, printed and issued a small pamphlet, entitled, "Traffic Information for the Convenience of Drivers," setting forth the penalties provided for infraction of the general and special regulations, the state and local laws governing speed, lights, sound signals, and other equipment, special regulation as regards ranking and parking, and any other information which may be useful in facilitating vehicular or pedestrian traffic.

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[1] Some cities already have ordinances or provisions of their city charters sufficient to empower their mayors or police heads to regulate traffic satisfactorily. New York has been doing this since October 30, 1903. However, an empowering ordinance such as here given would be more satisfactory, especially if standardized.

[2] Certain changes in terminology will be necessary, in some municipalities, to adapt this ordinance to meet local conditions; such as the substitution of "town" or "village" or "borough" for "city," and of "village president" or "burgess" for "mayor." In commission-manager cities it may be deemed advisable to give to the city manager, rather than to the mayor, the chief responsibility for traffic control. In all municipalities care must be taken that local traffic ordinances do not conflict with state motor vehicle acts.

[3] These general regulations, as revised to March 15, 1924, are printed in full in the 1924 *Municipal Index*, published by THE AMERICAN CITY MAGAZINE, pages 272 to 275.

SEC. 8.—That the Mayor shall cause to be used at any time or place, with or without notice, whether temporarily or permanently, such traffic guides as have proven to be or promise to be useful.

(a) Limit lines, in or on the pavement, may be used to define the boundaries of crosswalks, ranking and parking areas, safety, danger and neutral zones.

(b) Primary signs for warning and directing moving vehicles, including signs designating distance, shall have vivid yellow letters, arrows or graphics on a black background.

(c) Secondary signs for stationary vehicles, designating public parking or ranking spaces, shall have black letters, arrows or graphics on a bright yellow background.

(d) Tertiary signs for the control of pedestrians, designating crosswalks, etc., shall have vivid blue letters, arrows or graphics on a white background. (All traffic signs shall so far as practical denote their meaning by their shape as well as by their color, and no wording shall be placed on the face of any traffic sign except that required to denote its meaning, and this wording shall be the briefest and simplest necessary to express its meaning clearly.) The Mayor shall take steps to prevent the use of the combination of colors adopted for traffic signs for any other purpose near the curb in city streets or on any part of a country highway in the city of ....

(e) New portable traffic standards should have their bases made preferably in the form of an elongated circle, to prevent rolling if knocked down. The bases and tops of standards shall be painted bright red, the pipes or parts between the base and top with two black and three white bands, the top and bottom bands being white. Where standards are not placed within limit lines, they shall be placed on a painted white disk showing at least 6 inches outside the base.

(f) Traffic "mushrooms" or similar devices shall, when used, be always kept painted white and be placed on a disk painted white showing at least 1 foot outside of the mushroom.

(g) "Dummy cops" or similar devices may be used where practical, to assist traffic, and when used they shall be painted in a similar way to traffic standards and be placed upon disks painted white showing at least 1 foot outside of the base.

(h) Where new semaphores are provided, they shall be of such construction that the signs on them may be placed in a neutral position, so that when a traffic officer is not present the semaphores may be left to serve as dummy cops. Semaphores shall be painted in a similar manner to dummy cops and traffic standards, and where they are not provided with a platform they shall stand on white-painted disks.

(i) Traffic towers, or "crow's-nests" similar to those in use in Detroit, may be employed when, in the opinion of the Mayor, the expense warrants their use.

(j) Traffic regulation lights may be used when and where deemed desirable by the Mayor. The significance of such lights shall be: red, to stop; yellow, to exercise caution; green, to proceed.

(k) An electrically or mechanically operated signal used for the protection of highway traffic at railroad crossings shall present toward the highway when indicating the approach of a train the appearance of a horizontally swinging red light and/or disc.

SEC. 9.—That the Mayor shall cause to be issued to the members of the police force the following general order:

> "You are hereby informed that it is the duty of every uniformed member of the police force to correct and instruct drivers and pedestrians in the traffic regulations and reprimand them for infractions thereof; and if an offense is committed with obvious intent to obstruct traffic or to interfere with the rights or safety of others, to take the driver's name, number and address, the vehicle number, if it has one, or in the case of a pedestrian, his name and address, and such other particulars as may be available for identification of persons or vehicles, and report same to the traffic bureau or to police headquarters for action. In case of a serious or intentional offense the offender should forthwith be arrested."

SEC. 10.—That the Mayor may cause to be substituted such devices as dummy cops or traffic mushrooms for traffic policemen at such intersections, junctions, or foci of highways as can be practically as well regulated by the use of such devices.

SEC. 11.—That the Mayor shall see to it that traffic men shall use a uniform code of signals at crossings, so as to avoid confusing drivers and pedestrians.

SEC. 12.—That the Mayor may, in his discretion, from time to time send one or more men to other cities to study traffic work in order to keep abreast of all improvemens.

SEC. 13.—That the Mayor may provide the Traffic Director when on duty, with a motor-car or a motor-cycle in practical working order.

SEC. 14.—That the Mayor may carefully consider with a view to making recommendations to the City Council or the proper department of the city government, such matters as needed street openings, widenings, or changes in curbs or car tracks, or the removal of anything within or outside the boundaries of a roadway which prevents the best use of the highway or which seriously obstructs a view of traffic; and as an aid in making such recommendations may obtain advice from engineers or others who have made a study of traffic regulation.

SEC. 15.—That the Mayor shall forthwith and hereafter from time to time cause to be prepared from the best information available an itemized estimate of expenses necessary to furnish the city of .... with effective and up-to-date traffic regulation.

SEC. 16.—That in case any article or section of the general regulations or any special police regulation in regard to traffic is violated, the persons so violating or disobeying said general regulation or special regulation shall pay such fine or suffer such punishment as may be prescribed at the time of such violation by the laws of the state of .... or ordinances of the city of ....

ERIE CANAL IN SCHENECTADY BEFORE IMPROVEMENT

Old Erie Canal Now an Efficiently Lighted Boulevard

Schenectady, New York, Which Converted the Erie Canal into a Boulevard, Is Placing Ornamental Lighting Standards on Every Paved Street

A FEW years ago, when the newly completed New York State Barge Canal caused the abandonment of the old Erie Canal, Schenectady, N. Y., was faced with the same problem that was before many of the cities and towns of eastern New York, namely, how could the old canal bed be utilized to the best advantage? The city appreciated the opportunity offered and plans were made for the construction of a boulevard across the city, a direct route from the center of the business section to each of its largest manufacturing centers. One section of the boulevard has been completed and is 113 feet wide between curbs, with 20-foot sidewalks, parkways and underground wiring. This year, on the evening of the third of July, a switch was thrown in the local power station and this new Erie Boulevard was illuminated to fifty times the brilliancy to which it had been accustomed.

It is interesting to note that the request for this intensive illumination came from the property owners themselves. The Adirondack Power & Light Corporation, by which the installation was made, and the illuminating engineers of the General Electric Company had suggested a less impressive system. The property owners, however, realized the great advantage of added light, and enthusiastically endorsed the intensive white way installation. The same type of lamps has been installed along State Street, the chief business section. The lighting program which has been planned by the city specifies that there will be no more hanging lamps, and that in time the whole system will include "Schenectady" type ornamental standards. Schenectady has also decreed that every paved street in the city shall have ornamental lighting standards.

The details of the installation on Erie Boulevard are interesting as they show in all that 2,087 feet of street are lighted by 86 lamps mounted on 43 standards. This makes 24.25 feet of street per lamp. The total lumens per

ERIE BOULEVARD, SCHENECTADY, BUILT ON THE ERIE CANAL, SHOWING ILLUMINATION AT NIGHT lamp amount to 16,875, or 700 lumens per foot of street. The lights, which are mounted with the center 20 feet above the street, are carried on King "Schenectady" type standards and consist of Form 21 G. E. ornamental luminous arcs. The glassware, which has an efficiency of 85 per cent, is G. E. No. 126, medium density rippled alabaster globe, which has been approved by the Art Commission of Washington, D. C., for lighting in the Federal Capital. The arcs operate on 6.6 amperes, 80 to 85 volts and consume 532 watts each.

ORNAMENTAL LUMINOUS ARC LAMPS USED ON ERIE BOULEVARD, SCHENECTADY

A Brief History of Street Lighting

Street lighting is comparatively modern. Paris, France, was the first city in the world to install street lighting, the inhabitants being ordered in 1558 to place lighted candles in front of their houses. In 1788 pitch or resin bowls were substituted for candle lanterns. In 1809 illuminating gas was first used for street lighting in London, England. In 1821 Baltimore, Md., used illuminating gas for street lighting, and in 1881 electric arc lamps first made their appearance in New York City. Gas mantle lamps were first used in this country for street lighting in 1896. The modern history of street lighting began with the invention of illuminating gas and has continued with the development of the arc lamp and the incandescent light.

Need for Eye Conservation of School Children

A SURVEY of statutory provisions in the United States and Territories for testing the sight of school children has been made by the Eye Sight Conservation Council of America, Times Building, New York City. The results of the study are available in report form in Eye Sight Conservation Bulletin No. 4.

The report estimates that at this time the number of school children enrolled in the elementary and secondary schools of the United States exceeds 24,000,000, or over 20 per cent of the population. More than 60 per cent of this number are said to have eye defects of sufficient degree to warrant correction. Even simple visual tests reveal 25 per cent with manifest defects and symptoms of eye-strain. Many are contending with vision so defective that mental development is seriously retarded, and comfort, health and even safety are jeopardized. Fully 6,000,000 of our school children are at a disadvantage.

Conclusions set forth in the report, applying to the country as a whole, point out that there is a wide diversity in the provisions and regulations. It was found that statutory provisions for the examination of the eyes of school children have not been adopted generally by state legislatures, and that only twenty states have statutes providing for eye tests. There are only two other states that have broad regulations which take the place of statutes. In most instances general physical examination laws are not interpreted to include eye tests.

The report is published "as an argument that every state and territorial possession should recognize the importance of the care of the eyes of its future citizens, that tests for defective vision may be carried out advantageously by teachers in the schools with a negligible expenditure of time, money and effort; and that state boards of education should consider it their duty to approve and provide regulations, instructions and the necessary appliances, and to so supervise the work that all school children shall receive the attention that is their right."

In nearly all states little is being done outside the larger cities. There is pressing need for eye conservation in the smaller towns and in the rural districts as a part of the general plan to improve country life. Cooperation of state boards of health is advocated.

Results of Three Years of a Smoke Abatement Campaign

By H. W. Clark

Chief Deputy Smoke Inspector, Salt Lake City, Utah

DURING the winter of 1919-20, a detailed study of the smoke problem then existing in Salt Lake City, was made by this city in cooperation with the U. S. Bureau of Mines and the University of Utah. The conditions found and remedies suggested were set out in a full report in May, 1920, by Osborn Monnett, the engineer who directed the investigation.*

Late in 1920, an ordinance was passed following closely the suggested ordinance in the Monnett Report, and a new Department of Smoke Inspection and Abatement was organized. Active work began about January 1, 1921. The suggestions made in the Monnett Report have been followed out as closely as the funds provided would permit. The results of the campaign for four winters of supervision and three summer campaigns of reconstruction work have just become available in a report covering this period.†

The accompanying chart shows graphically the progress that has been made. Definite figures in the report show that smoke abatement results in a sufficient fuel saving each year to pay twice the cost of maintaining the Smoke Department.

The results of the campaign in Salt Lake City, to date, might be briefly summarized as follows:

The production of smoke from plants in the industrial and business districts has been reduced 93 per cent since the winter of 1919-20.

The number of hours during which light or dense smoke conditions existed in the atmosphere, as recorded by the U. S. Weather Bureau, has been reduced 32 per cent and 39 per cent, respectively.

The atmosphere of the business district, formerly the center of the smoke cloud, *is now the clearest part of the city.*

The smoke from railway locomotives has been reduced very materially, although definite figures as to the reduction are not available.

The city's future problem is to tighten up on enforcement, by police court prosecution against any plants that violate the ordinance; keep after railroad officials to get equipment improved and firemen disciplined for violations; and *last, but most important, to begin a real campaign of smoke reduction in residences.*

Procedure for Success in Smoke Abatement

The experience gained in Salt Lake City indicates that to accomplish results quickly and economically, procedure in smoke abatement work must be somewhat as outlined below.

In the first place, every plant in the city must be investigated in detail by an experienced engineer, and every measurement and every bit of data that will have a bearing on the plant must be obtained. The load of the plant must be accurately determined and this will determine to some extent the type of furnace changes to be made.

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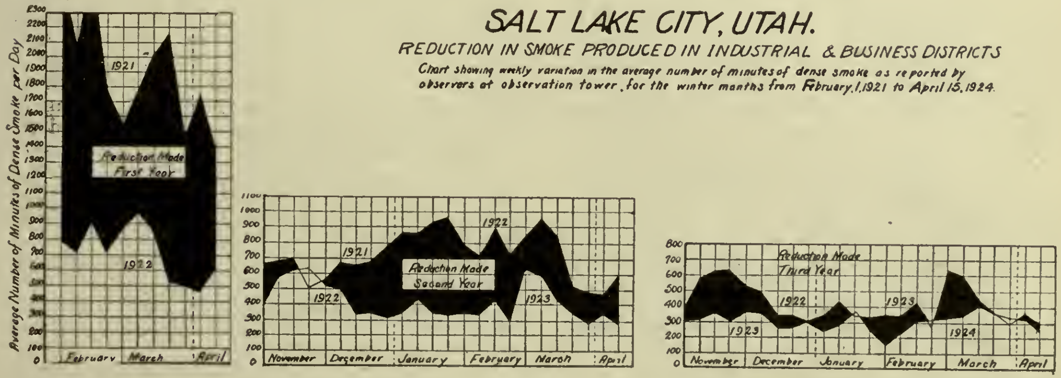
* See the July, 1920, issue of THE AMERICAN CITY for a brief review of this investigation by Mr. Monnett.

† Report of Smoke Abatement in Salt Lake City for Three and One-Half Years, by H. W. Clark. Copies of this report may be had upon application to Salt Lake City.



SALT LAKE CITY, UTAH.

REDUCTION IN SMOKE PRODUCED IN INDUSTRIAL & BUSINESS DISTRICTS

Chart showing weekly variation in the average number of minutes of dense smoke as reported by observers at observation tower, for the winter months from February, 1, 1921 to April 15, 1924.

The data obtained must be studied carefully, so that the most economical and successful solution possible can be worked out. This solution must be worked out in detail and in such a manner that it is absolutely certain that the desired results will be accomplished.

The next step is to get the owner to have the necessary changes made. As most ordinances do not make it mandatory upon the plant owner to make these changes at the request of the Smoke Department, it usually becomes necessary to persuade the plant owner to make the changes desired. Increased economy for the plant owner is certainly a great help in persuading the owner to make the changes, especially when the smoke abatement engineer can definitely assure the plant owner that such a saving will be made.

After the plants have been changed to put them into condition to operate without smoke, it is necessary to continue to patrol and supervise these plants to keep the operating crews on their toes in order to keep the plant clear. The amount of supervision required depends entirely upon the kind of men operating the plants. With many plants it will not be necessary to call on them, except on very rare occasions, and others will require visits almost daily to keep the plant from smoking.

The plants must be inspected periodically to keep them maintained in proper operating condition. Brick work is in need of repairs at frequent intervals, smoke pipes become leaky, and chimneys and combustion chambers get full of ash. In many cases, the owner will not have these furnaces cleaned or repaired unless the necessity is brought to his attention.

The smoke abatement department must be a permanent part of any city government where the smoke nuisance is troublesome. The campaign must be continuous if a city's atmosphere is to be kept clear. Ample work must be done each year to keep smoke down to the required minimum. If things are let go just one season, the conditions will immediately grow worse and much of the progress made in the preceding years will be lost in a very short time.

In order to continue to improve conditions in Salt Lake City at a satisfactory rate, it will be necessary to maintain substantially the same size smoke department to control the situation as at present, and, in addition, increase the force during five or six winter months to sufficient size to instruct and supervise the operators of all *residence heating plants.* If part-time men are used for this work, the cost of patrolling the residence district will not exceed fifteen cents per house per season.

Public Improvements and Increased Values

An Editorial from *The Christian Science Monitor*

WHEN nearly forty years ago Henry George, a San Francisco printer, who had written a book dealing with the persistence of poverty despite the wonderful progress made by inventive genius in increasing the production of wealth, became a candidate for Mayor of New York City, his proposal that all increases in land values due to the growth of population or public improvements should be taken by taxation for city revenue was regarded as rank socialism and an attack on property rights. So dangerous was his candidacy regarded that many prominent Republicans supported the Democratic candidate for Mayor, through fear that their own candidate, Theodore Roosevelt, could not possibly be elected. The suggestion that the progressive increase in land values should be taken for the benefit of the community, to whose growth and activities such increase was due, was denounced by some of the clergy and condemned by great business interests.

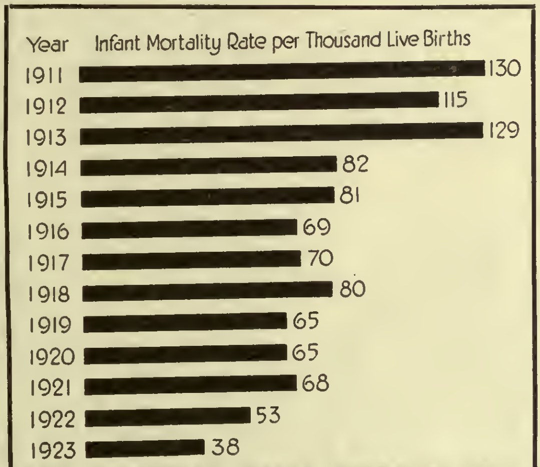
It will no doubt surprise many of those who then opposed the taxing of land values to find that the city of New York is now contemplating the construction of a subway under Sixth Avenue, the cost of which is to be provided by taxes on abutting property that will be benefited by the new transportation line. They will be further surprised to learn that, instead of regarding this innovation as confiscatory, the property owners along the proposed route are willing that they shall be taxed in proportion to the increased value of their land that is expected to accrue. Further than this, the corporation counsel of New York has rendered an opinion that the statute providing for assessing the cost of subways on the property benefited is entirely constitutional.

The difficulties in securing the enormous amounts of capital for the construction of new transportation systems, experienced by many great cities, will practically disappear if the system proposed in New York shall be generally adopted. On its face it would seem to be a perfectly fair proposition that a public improvement which will greatly increase the value of abutting property should be paid for by assessments on the increased values. The owners of the abutting land certainly cannot complain if they are called upon to pay part of their increased revenues for the construction of improvements which will directly benefit them. That land values which have been created by other activities of the community should be taken in taxation for public purposes may not yet seem so obvious, but the changed attitude of property owners in New York is at least significant as showing that the basic idea involved is finding general acceptance.

Reduction of the Infant Mortality Rate in Small Cities

By Edwin G. Ramsdell
Health Officer, White Plains, N. Y.

THE gradual reduction of the infant mortality rate in White Plains is instructive, because a definite effort has been made over a period of years to reduce this mortality, and it would appear that this effort has been effective. White Plains is a city of approximately 25,000 inhabitants, located within 23 miles of New York City. It is not a manufacturing city, the population being largely comprised of the so-called commuters' families. There is, however, a group of approximately 5,000 Italian people and a group of about 1,500 colored people. Most of the Italian and colored people reside in definite districts of the city.



THE DIMINISHING INFANT MORTALITY RATE IN WHITE PLAINS

It is difficult to analyze the relative importance of the factors concerned in the reduction of infant mortality, because the entire public health program of the community has a bearing on infant as well as general mortality. White Plains has been working along the following general lines to reduce its infant mortality:

1. To get all births reported.
2. To increase the efficiency of prenatal care.
3. To insure satisfactory hospitalization or home care for the lying-in period.
4. To follow up systematically all infants during the first year, and guide mothers when necessary in the problems of infant feeding and hygiene.
5. To emphasize the importance of keeping the well baby well through all possible publicity channels, the most effective being the Little Mothers' Leagues and the Junior Health Leagues.
6. To regulate strictly the community milk supply, advocating for infant feeding, pasteurized milk only.
7. To provide auxiliary health services at a general Health Center, including venereal disease clinics, tuberculosis clinics and dental clinics, as well as the regular infant welfare clinics which frequently become well-baby conferences.
8. To select carefully the nursing and medical personnel to carry out this type of program.
9. To obtain the confidence and cooperation of the practicing physicians of the community.
10. To coordinate the efforts of all organizations interested in the field of public health and infant welfare.

These are the ten principal factors which appear to have been most important in reducing the infant mortality in White Plains.

Prenatal and Infant Welfare Clinics

The work of the Prenatal Clinic is made effective by the enthusiasm of the nurse, who is obliged to visit frequently the homes of expectant mothers and urge them to come to the clinic for examination. Not infrequently does she have to bring these patients to the clinic in the ever-useful Ford. At this clinic, which is in charge of the obstetrician of the local hospital, a routine physical examination is made, including pelvic measurements, urinalysis, Wassermann test, and blood pressure observations. The doctor and the nurse cooperate with the practicing midwives and have secured their confidence. Early abnormalities are recognized and proper treatment instituted before it is too late. This early acquaintance with these mothers makes it possible for the department to institute a very early post partum follow-up.

A weekly infant welfare clinic is held at which babies are regularly weighed, formulas prescribed if necessary, and as much advice given to keep the well baby well as possible. The most important feature, however, of this clinic is the work of the nurse in following these mothers back to their homes to actually watch the preparation of the formula; to correct improper home conditions; to arrange the environment for the well baby which will tend to insure his keeping well. At the present time, White Plains has 486 babies enrolled at our Infant Welfare Station.

Little Mothers' Leagues

For ten years White Plains has been particularly fortunate in having a volunteer worker who has been able to continue the work of the Little Mothers' Leagues throughout the school system. She has graduated these little girls each year from her leagues, with some fundamental knowledge of the general principles of child hygiene. The lessons taught to these little mothers are carried into the homes, and are, without doubt, the most useful and the most effective method of infant hygiene publicity. At the present time, there are in White Plains five Little Mothers' Leagues with an enrollment of 231 little girls. We have also organized similar leagues for boys, which are called the Junior Health Leagues. Instruction given to these little boys is along a different line, but certainly contributes to the hygiene of the home. We have five Junior Health Leagues with an enrollment of 105 boys.

Milk Supply

The control of the milk supply has not been easy. We have an efficient laboratory service, which reports monthly on the bacterial count of all milk sold in White Plains. The minimum standards required by the State Department of Health are enforced, but it has been necessary almost constantly to threaten, first one milk dealer and then another, to keep even the pasteurized milk safe. This work is unpleasant, but is important. The public should stand back of the Health Department in preventing the sale of dirty milk.

Health Center Clinics

The Health Center clinics are useful. Expectant mothers who show a positive Wasserman may be carried through the course of salvarsan, and our records show several mothers who have never been able to give birth to living children before this treatment, who now have apparently healthy babies. The tuberculosis clinic affords an opportunity for careful chest examination with X-ray observations if necessary. Likewise, the dental clinic may prevent oral sepsis.

Nurses and Doctors

The type of nursing and medical personnel must be carefully selected. The nurses must be women of individuality and initiative, because the most important part of their work is carried on in the homes, where they are on their own responsibility. The nurse in White Plains, who has been specializing in the infant welfare work, has been with us for the past ten years. She knows infant feeding, is tactful with the mothers, is competent to instruct them in their homes with the preparation of formulas, and is enthusiastic and conscientious. The doctors at the various Health Center clinics have been selected not only on account of their ability, but because they represent affiliations with other institutions. For example, our obstetrician has charge of the obstetrical service at the local hospital; our tuberculosis clinician is in contact with the tuberculosis pavilion at the local county hospital.

The cooperation of the practicing physicians in the community has been obtained as a result of a deliberate effort to help them with their work, and to treat their communications with tact and consideration. We have obtained almost hundred per cent cooperation from the doctors in White Plains.

To coordinate the activities of private agencies interested in infant welfare, a monthly meeting was organized four years ago to which representatives from all such agencies were invited to meet the Health Officer. As a result, a permanent Public Health and Welfare Workers Monthly Conference was organized. This organization has been most helpful in bringing about a better feeling between various groups interested in the improvement of health conditions.

Continued Gain in Whole-Time County Health Officers

ACCORDING to data obtained by the Rural Sanitation Office of the U. S. Public Health Service, there was a net gain of 20 counties in the United States having whole-time health officers on January 1, 1924, as compared with the previous year. The total number of counties or districts providing such service for their rural sections increased from 109 in 1920, to 161 in 1921, 202 in 1922, 230 in 1923, and 250 in 1924. Most of the increases during the last year were in states in which the respective state health departments, with the cooperation of the U. S. Public Health Service or the International Health Board, or both, were enabled to give encouragement, technical advice, and financial assistance to county or district health departments.

Oil Fields Increase Municipal Construction in Monroe, La.

By H. H. Russell

City Attorney

MONROE, La., for the last few years has enjoyed a sustained development, industrially and commercially as well as in population. It is the parish seat of Ouachita Parish and is situated on the Ouachita River in northern Louisiana, approximately 40 miles from the Arkansas-Louisiana Line, 75 miles west of the Mississippi River, and 100 miles east of the Texas boundary. It has always been the center of a very fertile agricultural region, but, despite that fact, and although it is the third oldest town in Louisiana, it was in 1920 a town of but 12,675 people.

The Monroe gas field was discovered in 1917, and by 1920 large developments had been made. This development has been such that Monroe's population is now estimated at 20,000, and the industrial centers in the gas fields surrounding it give it an additional suburban population of probably 10,000. The growth of the city from a home-building and business standpoint has been fully as rapid as its industrial expansion, and the work of public improvement has kept pace.

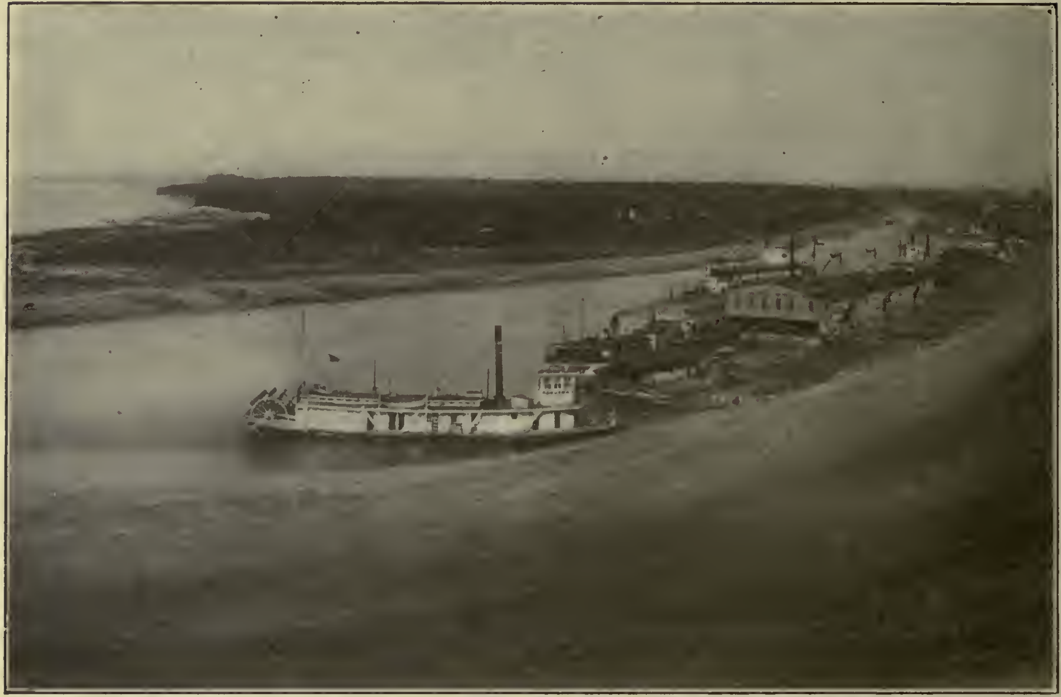
In 1920, there were in Monroe 0.6 miles of brick streets, 20 years old, and while the city owned its own electric light, water-works and power-plant, as well as its street railway lines, these utilities were old and run-down. In the last three years—in so far as street paving is concerned, I should say, in the past 29 months—there have been laid something in excess of 25 miles of modern asphalt streets, and work is going forward on contracts covering several additional miles, with the certainty that the present program, even if it does not have to be expanded to cover added growth, will by the end of 1925 see 40 miles of new pavement completed.

During the period 1920-1924, the municipality has built a new power and water-works plant at a cost of $650,000, and a new sanitary and storm drainage system at a cost of $500,000.

All the paving contracts to date have been awarded to, and the work done by, the E. J. Deas Company, which had been engaged in paving work in Shreveport and other Louisiana cities for some time prior to the inception of the Monroe program. All topping work has been done with Texaco asphalt. About 75 per cent of the completed mileage consists of sheet asphalt on a 6-inch concrete base, the sheet asphalt being composed of a 1½-inch binder course and a 1½-inch top or wearing surface. The remaining 25 per cent of the total mileage is asphaltic concrete, one course of 2 inches laid on a 5-inch concrete base. All streets have uniform combination concrete curb and gutter, and a complete system of subsurface drainage. Water is not permitted to flow more than one block in the gutters.

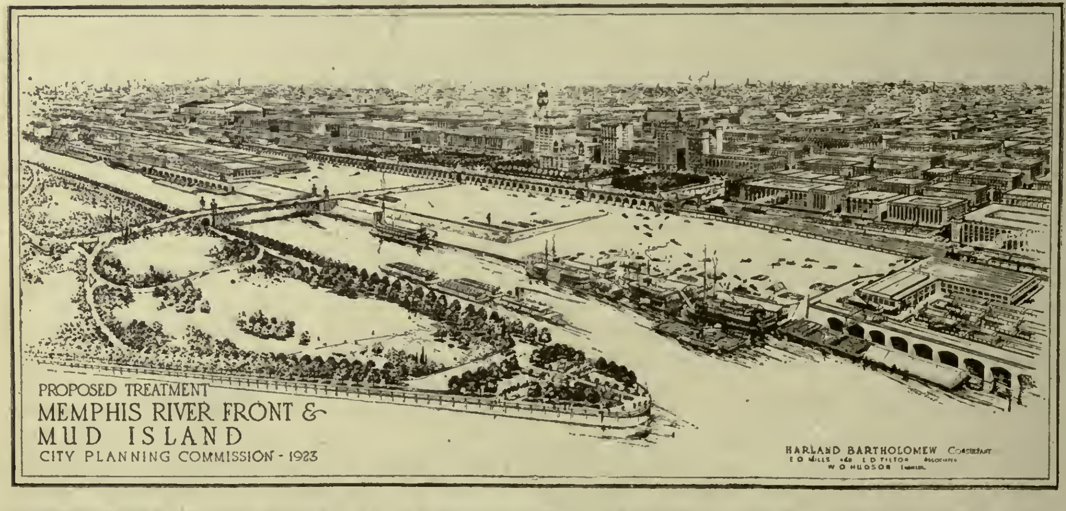
A TEXACO ASPHALT PAVEMENT ON LOUISVILLE AVENUE, MONROE, LA.

A River Front as It Is and Might Be



THE ISLAND IN FRONT OF MEMPHIS, TENN., AS IT APPEARS TO-DAY

This island has been created in recent years by the Mississippi River. It offers to Memphis a splendid opportunity to acquire, and to develop gradually, a park of large acreage virtually at the city's front door


PROPOSED TREATMENT
MEMPHIS RIVER FRONT &
MUD ISLAND
CITY PLANNING COMMISSION - 1923
HARLAND BARTHOLOMEW Consultant
E O MILLS and L D TILTON Associates
W D HUDSON Engineer

DEVELOPMENT OF THE ISLAND AND RIVER FRONT AS PROPOSED IN THE COMPREHENSIVE CITY PLAN OF MEMPHIS

This plan, in the recently published report of Harland Bartholomew, City Plan Engineer, carries the following caption: "Memphis has exceptional opportunity for development of the river front. The treatment suggested is not beyond realization. It has genuine utilitarian significance. It will largely solve the automobile parking problem. Twenty-five years hence such a water-front would be an outstanding civic asset"

Traffic Lines and Safety Zones Reduce Accidents in Memphis

By Mary Yerger Raymond

Safety Council Division of Memphis Chamber of Commerce

A MOST important step in the interest of community safety in Memphis was taken when the Memphis Safety Council was organized and became a division of the Memphis Chamber of Commerce. E. W. Ford, Vice-President of the Memphis Street Railway Company, was named President of the Council; and C. M. Anderson, then manager of the Safety Division of the Milwaukee Association of Commerce, was chosen for the position of Manager.

POSTER WIDELY CIRCULATED BY THE MEMPHIS SAFETY COUNCIL TO FAMILIARIZE THE PUBLIC WITH THE NEW TRAFFIC-MARKING REGULATIONS

During the formation period Carl L. Smith, field secretary of the National Safety Council, spent some time in Memphis assisting in the initial work and organizing the Bureau in line with the national plan. The Council became a division of the National Safety Council and has consistently adhered to the policies of the parent organization.

During the eleven months which have passed since its organization, the Council has justified its existence and performed a notable service to Memphis. Continuous safety propaganda has been circulated in the attempt to prepare the public mind for safety measures. A school for truck drivers was conducted during the winter, which was attended by over six hundred drivers of commercial vehicles.

Organized school safety work was carried on through Junior Safety Councils, a special feature of which was the patrolling of dangerous street intersections near the schools. The boys in these patrols were trained by an officer furnished by the Police Department, which has actively supported the work of the Council.

One of the latest and most effective accomplishments in the interest of safety is the system of traffic marking, which was the result of intensive study of the traffic situation by the Council's traffic division and representatives of the Memphis Police Department.

That study resulted in a comprehensive plan for the protection of the pedestrian and motorist, which was recommended to the city authorities, approved, and put into effect on May 25. In an article printed in the June issue of the *Memphis Chamber of Commerce Journal,* Earl R. Barnard, Inspector of the Memphis Police Department, explained the purpose of the new regulations, as follows:

"Clearance lines have been marked for motorists along street car tracks on Main Street, and safety zones at street corners for pedestrians have been designated. These clearance lines will permit automobiles to run between parking lines, in this way eliminating congestion, preventing accidents and enabling street car passengers to reach their destinations sooner.

"The pedestrian lanes, formed by the crosswalk lines, are used to guide pedestrians, who should move with the traffic and not against it. Automobiles will be required to stop behind the pedestrian line, in order to provide a clear walkway for the pedestrians.

"Parking lines have been marked, which means that automobiles must park parallel to the curb inside of these lines.

"It will be understood that in marking the boulevards with the center line, the purpose is to keep traffic to the right of this line at all times. Actual demonstrations have proved that this results in greater safety and in appreciably speeding up travel on the boulevards. Slow-moving vehicles should drive near the curb to enable automobiles traveling at a higher rate of speed to pass to the left of such vehicles and remain on the right of the center line.

"A feature of the recent improvements which will add materially to the comfort and security of those using the streets is the new type safety zone, which has been installed on Main and intersecting streets. These zones provide islands of safety for pedestrians where they can feel reasonably safe before boarding or alighting from street cars. This feature enables vehicles to pass with safety without waiting for street cars to get under way.

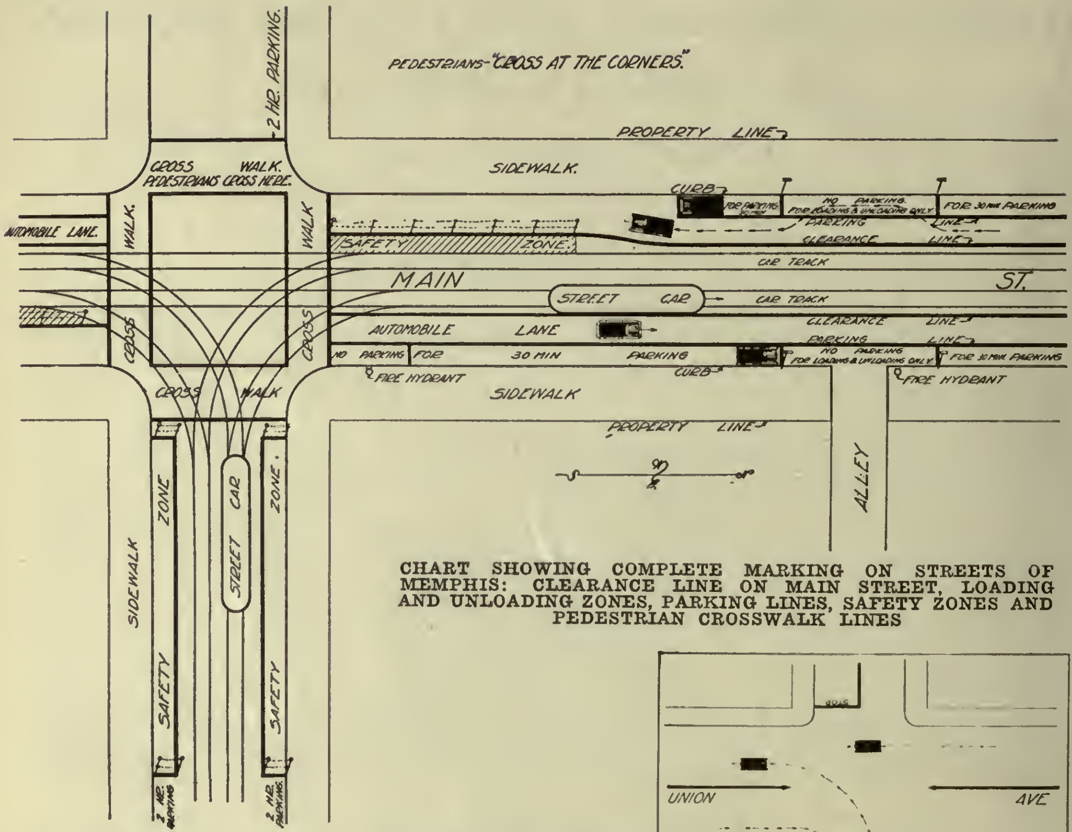


CHART SHOWING COMPLETE MARKING ON STREETS OF MEMPHIS: CLEARANCE LINE ON MAIN STREET, LOADING AND UNLOADING ZONES, PARKING LINES, SAFETY ZONES AND PEDESTRIAN CROSSWALK LINES

This, however, does not apply to closed safety zones.

"It was after a study of the experience of various cities in the United States that the Police Department and the Safety Council's Traffic Division concluded that the type of zone now in use would prove practicable and satisfactory in Memphis.

"The safety zone, it should be understood, is for the convenience of drivers as well as pedestrians. Motorists are cautioned not to stop in the safety zone (safety lane) to unload or take on passengers. This not only results in congestion of traffic but invites accidents as well. Pedestrians should enter and leave the safety zone at the intersection. The 'entrance' and 'exit' are clearly marked at each zone."

In addition to the marking features, new parking rules became effective on the same date, which clearly outlined the Police Department's ruling affecting parking, the use of loading and unloading zones and the space in front of fire hydrants or alley openings.

The efficacy of the new safety provisions was demonstrated during the recent United Confederate Veterans' Reunion, held in Memphis, June 4, 5 and 6. With over 50,000 visitors, 5,000 of whom were old and infirm veterans, not one accident occurred.

Valiant work was done by the Police Department, the Boy Scouts, R.O.T.C. cadets and others, but it is the belief of those who studied the situation that the clearly defined marking system played no small part in the remarkable achievement. It was recognized, too, that the Memphis Safety Council has not been idle, but has done much to make a reality that most powerful factor for safety—public cooperation.

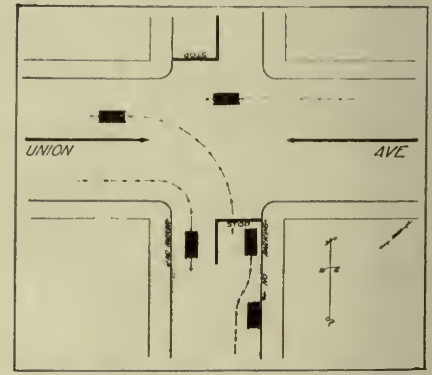
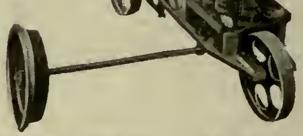


CHART SHOWING INTERSECTION WITH "STOP" MARKING ON UNION AVENUE



LINE-O-GRAPH MACHINE USED IN STREET TRAFFIC MARKING, EQUIPPED WITH A SPECIAL ATTACHMENT WHICH ENABLES ITS USE ON THE CAR TRACK, FACILITATING THE MARKING OF THE PARALLEL CLEARANCE LINE. THIS UNIQUE ATTACHMENT WAS DEVELOPED BY J. J. VAUGHAN, MASTER MECHANIC OF THE MEMPHIS STREET RAILWAY COMPANY

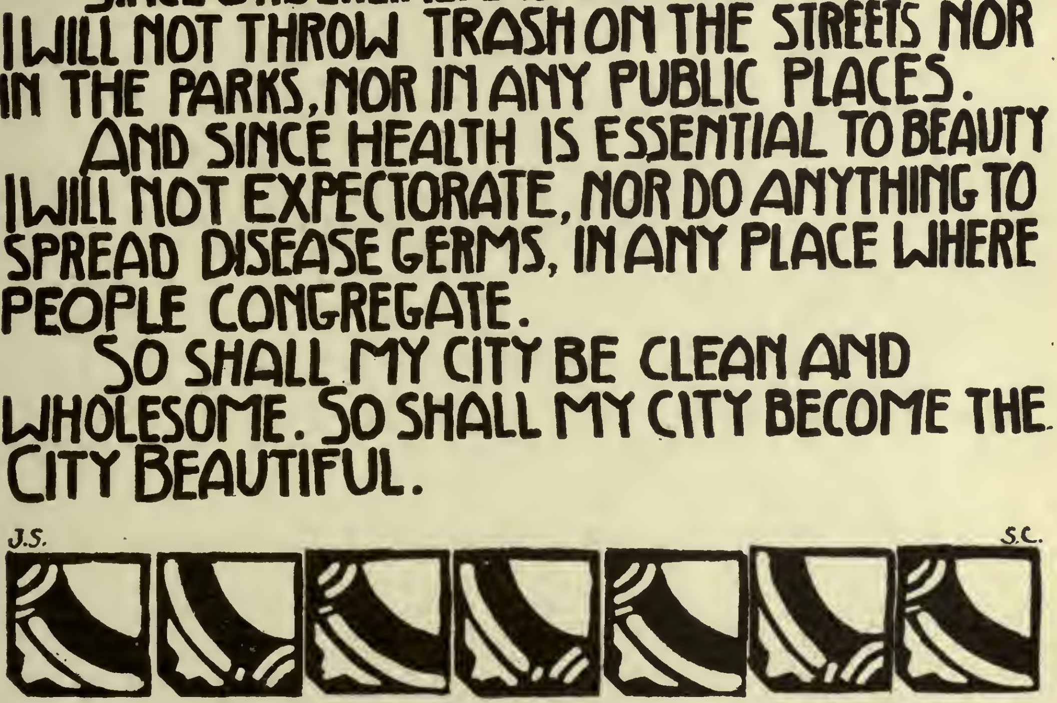
THIS IS MY CITY

AND BECAUSE I LOVE IT I SHALL TRY TO MAKE AND TO KEEP IT BEAUTIFUL.

SINCE ORDERLINESS IS ESSENTIAL TO BEAUTY I WILL NOT THROW TRASH ON THE STREETS NOR IN THE PARKS, NOR IN ANY PUBLIC PLACES.

AND SINCE HEALTH IS ESSENTIAL TO BEAUTY I WILL NOT EXPECTORATE, NOR DO ANYTHING TO SPREAD DISEASE GERMS, IN ANY PLACE WHERE PEOPLE CONGREGATE.

SO SHALL MY CITY BE CLEAN AND WHOLESOME. SO SHALL MY CITY BECOME THE CITY BEAUTIFUL.



Art Posters: An Aid to Movements for Civic Betterment

By Minna McLeod Beck

Art Director of Schools, Harrisburg, Pa.

ONE of the best aids to effective teaching in civics is the art poster. Think of the opportunity for service here, for rendering real assistance to a worth-while cause and, at the same time, for realizing in the pupil aims of great educational value.

These aims are, broadly speaking, two: to get over to the pupil, first, propaganda of an educational nature, say with regard to personal health, civic needs and responsibilities, etc.; and, second, to teach him, by means of the problem assigned, art principles such as good spacing, tone relationship, and color harmony which will be valuable in their application to many other subjects. A subsidiary aim here, which for some pupils may subsequently become of paramount interest, is the vocational or professional aspect of poster-making.

It is this second aim, of course, which justifies the place of the poster problem in the art outline, or course of study. However, considering the nature of the first aim, would the teacher be justified in assigning, for art study purposes, aimless and vague subjects such as "October," "Spring," "Wayside Inn," etc.? Scarcely—and especially as the pupil's reaction to a problem is much greater if he feels that he is rendering service or doing something for which there is an immediate need or recompense. This last is the psychological justification for the motivated poster problem.

We have had in Harrisburg, in connection with our public school work, a number of successful poster campaigns. One was in cooperation with the Welfare Association; another advertised Music Week; and one of the most successful was that connected with a Clean-up Week program.

The Mayor of our city usually issues a proclamation setting aside a certain week as Clean-up Week. The Art Department of the schools, anticipating this proclamation, wrote to the Mayor offering the assistance of all the sixth and seventh grades in the city. The enthusiasm of the special teachers of art, the grade teachers, and, above all, of the pupils themselves, was all that could be wished, and splendid results were obtained. There were hundreds of posters clever in ideas and good from the standpoint of design.

One of the newspapers of the city altruistically agreed to print for us one thousand each of two posters which seemed particularly appropriate. On the first day of Clean-up Week these two posters, one of them beginning, "This is my City," and the other, "I am the Guest of this City," after being framed in the Woodshop of the Technical High School, were placed conspicuously in the very center of Market Square, around which all the traffic circulates. On the same day, as previously arranged, the Boy Scouts distributed these posters over the city, and many merchants placed them in their windows.

Another feature of the week was the exhibition, in the windows of a large department store, of many original posters, chosen for good design and bright ideas. These were labeled, "Posters Made by the Children of Harrisburg in the interest of Their Community"—a slogan adopted for all our window displays of like nature.

The Chamber of Commerce was interested in the campaign and mailed to all its members in the city, and friends out of the city, copies of the printed posters. The newspapers were generous in their praise of the pupils' work and there was much favorable comment.

It must not be forgotten to mention that, in initiating this problem, the true purpose of Clean-up Week was explained—the matter of *stressing* cleaning up for *one* week in order that for *fifty-two* weeks its lessons need not be forgotten.

Watertown, N. Y., Erects Memorial Health Building

A NEW health building, designed as a memorial to the men of Watertown who served in the World War, has recently been formally opened in that city. It will contain a bronze tablet of Tiffany design bearing the names of local men who died in service. The property represents a value of approximately $50,000. The lot was a gift; about $25,000 was donated by contributors to the Watertown War Chest, who assigned to this later project the amounts which otherwise would have been returned to them at the close of the war activities; the balance was raised largely by private subscription. The architects contributed their services.

The building is centrally located, stands alone, and is assured light on all sides. Its dimensions are about 45 by 78 feet.

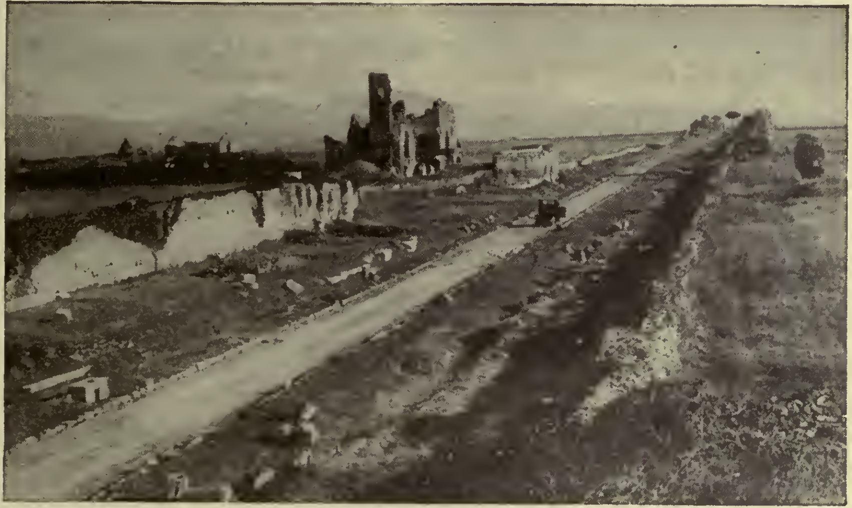
In addition to the office of the superintendent and offices for the local Red Cross Chapter, quarters will be provided for tuberculosis, child welfare, dental and other clinics. A parking space for baby carriages has been provided in the basement.

The erection of the Memorial is due largely to the efforts of the Watertown Visiting Nurse Association.

The description of this memorial appeared in *Health News,* New York State Department of Health, Albany, N. Y. The view below shows the exterior of the building and gives an idea of its substantial construction.

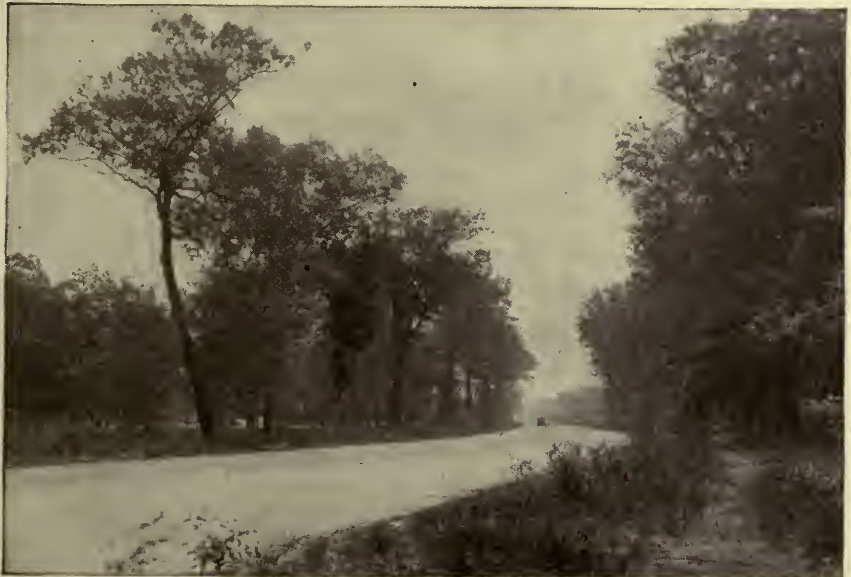
WATERTOWN'S MEMORIAL HEALTH BUILDING

Good Roads---312 B. C. and 1924 A. D.



ROME'S "QUEEN OF ROADS"—THE APPIAN WAY

Via Appia, the Appian Way, was constructed as a military road from Rome to Papua, a distance of about 142 miles, by the Emperor Appius Claudius about 312 B. C. and was later extended to Brundisium, a total of about 360 miles, and completed by Julius Caesar. It was known as "the Queen of Roads" and was adorned with statuary and pagan temples. It was built without regard to cost, by slave labor, and is said to have been in excellent condition 800 years after its completion. The illustration shows a portion of the road uncovered in 1850 and the ruins of ancient temples as they stand to-day. To build such a road to-day would cost about $250,000 a mile. Its inadequate width of 18 feet seems ridiculous as compared with the requirements of to-day's important transport arteries



AMERICA'S "IDEAL SECTION" OF THE LINCOLN HIGHWAY

Compare this outstanding example of modern American highway construction, the Ideal Section of the Lincoln Way south of Chicago, with the road which expressed ancient Rome's best efforts 2200 years ago. The Ideal Section is 40 feet wide—10 inches of reinforced concrete. It has been suggested that this section of the Lincoln Way be marked with tablets commemorating the men who have had most to do with modern America's highway progress. The transcontinental road is being beautified and adorned with monuments and tablets marking historic points in many states. The Ideal Section paving, said to be indestructible by traffic, cost $62,000 a mile. These illustrations are published through the courtesy of the Lincoln Highway Association

Winter Construction of Public Works

PUBLIC works form more than 25 per cent of all construction, varying in the last few years from three-fourths of a billion to over a billion dollars. Their proper control is, therefore, of the greatest importance in any program to distribute general construction activity more evenly throughout the year. Good public policy requires that contracts for public works should be let when the work can be performed economically and with the least possible interference with private construction. How seldom such a policy is followed is shown by the replies of 200 engineers in all parts of the country to the question "Are public improvements rushed right along in the peaks of the annual building season?" To this 192 answered "Yes," and many added that public works were initiated without regard to private demands upon the construction industries.

The report of the President's Conference on Unemployment, on "Business Cycles and Unemployment," brings out clearly how well adapted public works are for long-range planning, for expansion in years of depression, and for slowing up in years of general business activity. It is equally possible and desirable that public works be planned with special regard to seasonal conditions, and that all work which is not urgently required be either held up until the peak season is past or started early enough to take advantage of the general midwinter slump. With the intelligent use of new methods of construction and of protection for both men and buildings during the winter season, much of this work is well suited for economical prosecution during the winter. That work which is not suitable to carry on actively during winter weather can still be planned so as to proceed at maximum capacity during the intermediate months rather than during peak periods in private work.

One obstacle that has been found to prevent such conscious scheduling with reference to seasonal conditions is the limitation imposed either by statute or customary procedure in preparation for public works construction. Thus, where work is dependent upon appropriation by a legislature, and that appropriation does not become available until late in March or April, the work, if carried forward promptly, is likely to come within the peak of private activity. In many other instances the number of necessary legal steps which must be taken before the contract can finally be awarded and the length of time either required by law or made necessary by the procedure itself, so delay the work that it is considered necessary to rush it on to completion as rapidly as possible after the awarding of the contract. In cases of this sort, if the procedure could be simplified or if each step were not dependent upon a preceding step, a good part of this lag could be eliminated and time enough remain so that construction could be scheduled from a seasonal standpoint and, though sometimes stretched out over a longer period, still permit completion at a date as early as under present practice. A very definite step to improve such situations is the provision, either general or specific, that funds be made available to administrative officials for the preparation of plans and specifications well in advance of the time actual construction is to begin, in order to reduce the delay after the appropriation is made.

Seasonal Operation in the Construction Industries: The Facts and Remedies

Under the foregoing title there has been published by the McGraw-Hill Book Company, of New York, a Report and Recommendations of a Committee of the President's Conference on Unemployment, with a foreword by Herbert Hoover. The accompanying article comprises part of the chapter on Public Works.

How Officials and Contractors Can Help

The public administrative officials in charge of construction work can play an important part in making such changes as are indicated by the needs for economy and employment. Foresight in planning the work, the collection and use of information showing exactly what the seasonal trend is in construction of that particular kind, and the efforts made to change customary or legal requirements which operate to accentuate the seasonal tendency in their construction work are having a considerable and increasing influence in the right direction. If the administrative officials in charge of public works construction were possessed of discretionary powers governing both the letting of the contract and the time limit within which work must be completed, they could effectively be made responsible for the practice of economies and the pursuit of a policy of relieving unemployment through the best timing of the work.

Contractors on public works, as well as those on private jobs, can greatly assist by making a thorough study of the most successful methods employed in winter construction as well as of the problems of management and organization involved. Where there are opportunities to take advantage of lower prices of materials, and where greater efficiency is secured from labor during times when employment is less plentiful, the contractor has it in his power to encourage public works in off-seasons by passing on these benefits in the form of lower bids. Since his overhead cost per job or unit of work is considerably lessened when his organization is kept together throughout the year and his machinery and equipment are idle for a shorter period, he can, by taking on winter work, cut his customary margin of profit and still make more money as a result of the full year's work. Contractors, by their general attitude, their willingness to take work during the winter and perform it satisfactorily, and probable lower bids and other inducements, can exert a considerable influence upon the officials with whom contract letting rests, to the end that work shall be timed when it can be carried out most economically.

Making Funds Available

Legislative bodies have an important part to play in bringing about a change in the present methods of handling public construction jobs. Where continuing appropriations for a particular kind of work are required in order that such work may be intelligently scheduled to come as largely as practicable in slack seasons, they should be provided. In some cases the granting of greater discretionary powers to the administrative officials in charge of work is needed, and where the legal requirements surrounding the methods of contract letting are unnecessarily complicated or obsolete, active steps should be taken to change them.

In cases of cities where construction funds are not available until the beginning of a fiscal year, at a time which makes contract letting necessarily coincide with the peak in private letting, provision could be made for contracts to be let and work to start before the beginning of the fiscal year when the money is to become available. Where changes are advocated by administrative officials in order to allow them to schedule their work more effectively, attention should be given to the seasonal conditions in question and every possible allowance made so that the construction year may be lengthened.

Crystallizing Public Opinion

The attitude of the general public is of the utmost importance in this problem of the seasonal aspects of public works construction. It is the general public which pays the bills for expensive construction during peak periods, and which suffers because of unemployment in slack times. An active interest in the whole subject, and realization of the large losses and waste involved in a seven to ten months' building year, should result in bringing sufficient weight of opinion to bear so that all concerned will be forced to accept the new viewpoint. The leadership of civic bodies within the community and of newspapers and other public agencies will help in molding and crystallizing public sentiment and will result not only in lower costs of construction and more efficient work, but in lessened unemployment during slack seasons, and in the elimination of such wasteful competition for labor and materials between public and private work as was witnessed in the summer of 1923.

While public buildings for the use of state and local governments are subject to the same climatic limitations as private buildings and, in addition, to limitations governing the authorization and expenditure of money, this field contains probably the best possibilities for off-season construction. Although the amount of building of this kind is small when compared to the total of all kinds of construction, yet the erection of a large public building in a small community is likely to have an important influence for stabilizing construction. The results of public buildings so planned should be more economical construction for both the public and the private builder, lessened overhead costs, actual savings to the taxpayers, and diminished unemployment in the community during the winter period. Here is a case where the real remedy lies in influencing the point of view of the public and of the legislative bodies and officials directly in charge of this construction work. Contractors who do work of this kind, civic organizations, and individuals can all help to develop this point of view. The effect of such work carried on at a maximum speed during the winter, and slackening up when private demands are greatest, would be very important, since men are employed who would otherwise be idle at one period of the year and are released for other purposes during the busiest season.

Sewers and Water-Works

Another important type of public works in cities is the construction of sewer and water-works systems. This work is entirely out of doors and subject to the fullest extent to weather conditions. The argument of the severity of the climate in northern cities is generally advanced as making impossible the successful prosecution of such work during the winter, but a number of cities with the most rigorous climates have a contrary experience.

The favorable experience of these latter cities seems to indicate that there are different points of view and different experiences in conducting the same work under apparently similar conditions. This appears to show that the habits of the contractors and the attitude of those in charge of the work need to be changed in order to carry on winter work of this kind successfully. That it can be done successfully is shown by the cases mentioned above. Until methods are changed as a result of experience, it is not unlikely that experiments might prove not wholly successful. With more experience to draw upon, with labor adapting itself to new conditions, with the more extensive use of modern machinery for excavating, back-filling, and work of that kind, and with increased understanding of the public policy served, it is probable that most of our northern cities can successfully carry on this work throughout the year.

Winter Contracts, Winter Delivery, and Spring Execution

Even in the cases where it is not desired actually to carry on outdoor work during a period of two or three months, a great deal can be accomplished by such a program as Boston has adopted. During the winter months, contracts are awarded for pipe, special castings, and machinery, so that delivery is made in whole or in part during the winter months. Contracts for pipe-laying, building foundations, etc., are drawn up during the winter, so that after materials are received, work may be started as soon as the season will permit.

Where it is definitely known that a certain piece of construction is to be carried on next spring, it is highly desirable that arrangements be made and orders given during the winter for the supplies of pipe and other materials that will be needed. This not only has the effect of enabling work to be started as soon as the season will permit, but it has more far-reaching effects in enabling pipe and equipment manufacturers to carry on their work more fully during what is ordinarily an off-season. In the case of cast-iron pipe at least, the winter is the most efficient manufacturing season, and a policy of winter ordering would have far-reaching results.

This is a case for the attention of those immediately in charge of public works of this character and also of those administrative officials who shape the policies of their departments. Some effort is bound to be required to change existing habits, but if the experience of some of these northern cities is a guide, the effort thus spent will have a widespread beneficial effect.

Bandit-Chasing Cars with Bullet-Proof Glass

BANDIT-CHASING cars, manned by policemen with rifles, are now being used by the Department of Public Safety of the city of Philadelphia, in combating the activities of bandits. The cars are equipped with wind-shields and wind-deflectors made of bullet-proof glass, which protect the officers from gun fire. This special bullet-proof glass is made of three pieces of glass with two thin strips of pyralin sheeting cemented between them. The sheeting retards the normal fracture of the glass under the impact of a bullet and there is no shower of flying pieces, but merely a cracking of the glass. Cars equipped in this manner give the police the advantage in a gun-fire chase after bandits and have proved so useful and practical in Philadelphia that a number of other cities are planning to install them soon.

Bullet-proof glass is also being used for windows in bank tellers' cages, theater and moving-picture box offices, pay cars and bank collection cars, where employees who worked behind ordinary glass shields were exposed not only to the hazard of the bandit's bullet crashing through, but also to the hazard of flying glass should a pane be broken accidentally.

To the casual observer this special glass has every appearance and possesses all the visibility of regular window glass.

Radio Fire Hazards at Receiving Stations

By A. C. Huston

Assistant Chief Engineer, The National Board of Fire Underwriters

WITH the introduction and wide use of radio, the general expectation was that aerial antennae stretched from chimneys to posts, from trees to houses and from one part of the building to the other, would provide a most inviting path for the travel of lightning to the house, with the possible consequence that the building would be destroyed and persons would be killed or injured. This applies only to the antennae outside of buildings, since indoor antennae present no lightning hazard.

The experience with telephone and lighting systems was such as to justify the opinion that if proper lightning arresters were installed on the lead-in wires from aerial antennae, little trouble was to be expected. This has proved to be the case with radio installations, as records show that there have been very few cases where the discharge of lightning has resulted in injury to persons or damage to property. There have been infrequent instances where a building with a radio antenna has been struck by lightning and the radio equipment destroyed, but in practically all these cases the installation was faulty in some respect.

It may be said, then, that there need be no fear of increasing the danger of a building's being struck by lightning because of use of an aerial antenna, if it is properly installed and provided with a grounded lightning arrester. There is, however, a very distinct danger from the outside aerials if they are not properly installed with respect to other wires. There have been several cases, notably one in Montclair, N. J., where a defective aerial has come in contact with high-tension electric lines and persons have been killed, or property has been ignited by a short circuit through the building.

This matter is of such moment that cities are justified in requiring that all outside aerials shall be approved by some proper authority after suitable inspection. A number of cities have such requirements, thus preventing the erection of an aerial or lead wire over or near high-power wires or within close proximity to the ordinary commercial lighting wires.

Normally, the aerial and the lead-in wires carry only the induced current of the radio waves and there is no need of using insulated wire. The possibility of a cross with high-tension or the commercial lighting circuit, however, justifies attention to the insulation of the lead-in wire as it is carried around the building.

Fire Hazard of Storage Batteries

The earlier installations, consisting of a simple crystal set well installed, did not have any feature which would, aside from the danger from lightning or a cross with high-tension wires, increase the fire hazard, or lead to a life hazard. The present trend, however, is towards tube sets using storage battery or dry cells of high voltage, or to use the commercial house-lighting circuit. These introduce a distinct fire hazard, as the voltages and current used approach those of the commercial light, which as everyone knows, is a fire hazard if not properly installed. With the storage battery there are usually various charging devices and the necessary wiring to run from the batteries to the instruments.

All of the wiring in connection with batteries should have equal insulation and be as well installed as the ordinary house circuit. Even the ordinary dry cell, if short-circuited in the vicinity of inflammable material, may result in a fire. The storage battery has been one of the most prolific causes of destruction of automobiles, and it may be expected to have a similar record in connection with radio sets, if proper care is not taken to prevent short-circuiting and the consequent heavy discharge of current. The serious possibilities which may result from an attempt to use radio current direct from a lighting circuit are such that it would appear very unwise to use any appliance which had not been thoroughly inspected and tested as to its suitability, and this inspection should be made by some competent agent, such as Underwriters' Laboratories.

In conclusion, it may be said that with the simpler sets there is little fire hazard, beyond that from lightning, or from a cross with high-tension wires, and the danger to life is practically negligible if properly installed. As the higher-powered sets are introduced, the danger from fire and severe shock to individuals becomes greater, and there may be an increasing need for rigid inspection of the installation of these sets and the batteries and other various instruments which go with them, to see that they are installed in full compliance with the regulations of the National Electrical Code.

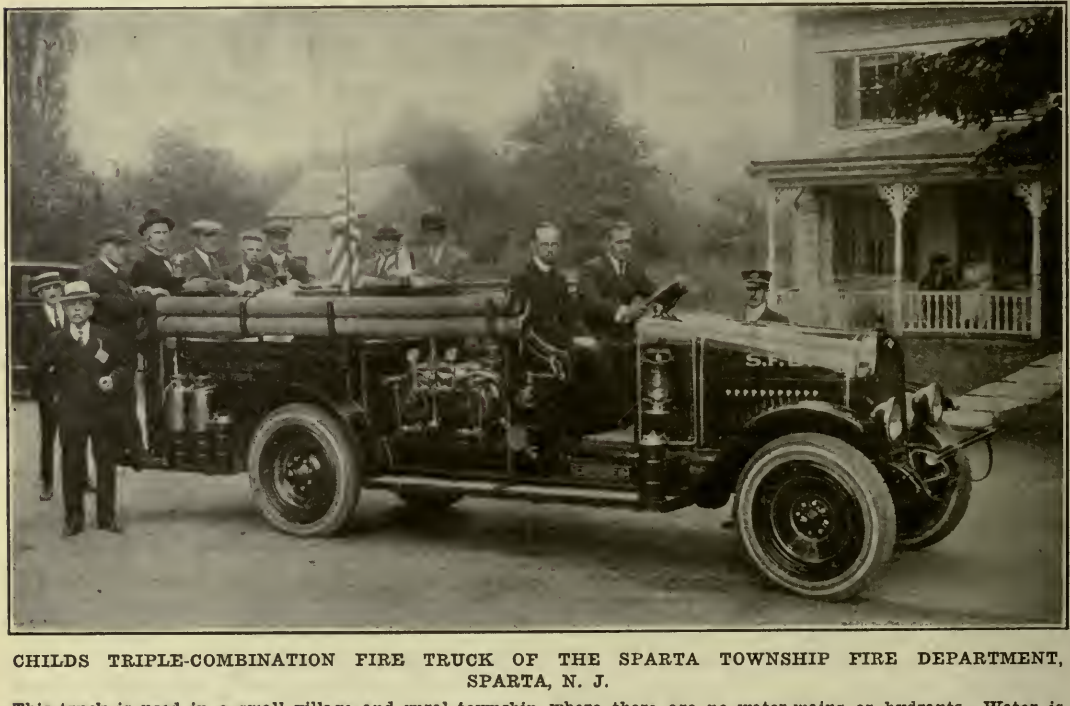
Acknowledgment.—From a paper read at the Buffalo Convention of the International Association of Fire Engineers, August, 1924.

Motor Trucks in Municipal Service and Fire Departments

TWO AMERICAN-LAFRANCE COMMERCIAL TRUCKS IN SERVICE IN BLOOMFIELD, N. J.
The truck on the left is a 2½-ton model, and the one on the right a 5-ton model. These trucks are equipped with special steel bodies for hauling garbage and are also provided with a special attachment in front to enable them to use snow-plows for street-cleaning purposes during the winter

Have You Seriously Considered Snow Removal?

It will soon be too late to formulate a satisfactory plan for the removal of snow from your streets this coming winter. Think it over before the snow arrives, and then emergencies will not arise.



CHILDS TRIPLE-COMBINATION FIRE TRUCK OF THE SPARTA TOWNSHIP FIRE DEPARTMENT, SPARTA, N. J.

This truck is used in a small village and rural township where there are no water-mains or hydrants. Water is drafted from brooks and ponds, which abound, and the 400-gallon pump and two 45-gallon chemical tank afford the best possible protection under local conditions, according to Rev. Edwin S. Ford, Chief, Sparta Township Fire Department, to whom we are indebted for this photograph and information. The Foamite-Childs apparatus is mounted on a Larabee speed chassis. The truck has performed well at a midnight fire which had gained considerable headway before discovery, and negotiates successfully the bad roads and steep hills found in parts of the township

Keeping Down the Up-Keep of Municipal Motor Equipment

The Present Extent of Central Garages in American Cities and the Resultant Savings

By Russell Forbes

Research Secretary, National Association of Purchasing Agents, New York City

CITY government could never have met the demands of its citizens for so highly diversified service without the aid of the automobile. Modern municipal government is to-day "motorized" in practically all of its branches. Automobile power, on account of its greater speed, freedom from fatigue, and greater hauling capacity has almost replaced horse power in many cities.

The number and value of automobiles in use by the municipal industry has increased tremendously during the last decade. The Power Wagon Reference Book, 1923, showed that in 1911 motor trucks were used in only 85 of our cities, and that a total of only 387 were then in operation. In 1920 the number of trucks in use had increased to 7,840. In 1923 over 16,000 were in use in 3,895 cities. The 16,000 trucks represented an investment of almost 31½ million dollars. This does not include other motor equipment now widely employed by city governments, such as street sprinklers and sweepers, ambulances, and passenger cars and busses.*

Each department or branch of a city government at first considered its motor equipment as separate and distinct from that of other departments and insisted upon a separate administration over it. The general public and city officials themselves have of late gained a new conception of a city government as a unit, so that a department in many places no longer considers equipment operated by it as its own exclusive property. This has made possible a centralized control over the motor equipment operated by all departments of a city.

Some cities now operate all their motor cars on a "taxi" basis, whereby an accurate record of mileage cost for each car is maintained, and each using-agency is charged its pro rata share of the expense on a mileage basis. All cars are thus housed at a central point when not in use, and the use of city-owned cars for "joy-riding" by city employees is almost entirely eliminated. Other cities vest the custody of their cars in departments to which they are assigned, but operate a central garage where all city cars are serviced and repaired.

Garages in Thirty-One Cities Compared

The writer has been in touch, either by correspondence or by personal visit, with the majority of municipal garages now in operation in this country. The accompanying tables (Figure 1) give a digest of the equipment owned and the system followed in thirty-one cities. Group I compares the system in operation in fourteen of our larger cities, each owning 75 or more motor vehicles. Group II compares seventeen cities each having less than 75 motor vehicles. In all of the cities covered by this report, the motor equipment of the fire department is housed, repaired and serviced separately, either in the fire stations or in some central station under the department's exclusive supervision. The information shown for Newark, N. J., applies only to the Department of Streets and Public Improvements, but this department has charge of more than one-half of all city-owned cars.

In the majority of the cities shown on the digest, the municipal garage is under supervision of a superintendent or foreman who devotes his entire time and attention to the task. In three cities, control of the garage is vested in the city purchasing agent. In two others, the city manager personally supervises. The city of Detroit has a Department of Motor Transportation, of which the municipal garage is a branch. In Bridgeport, Conn., a special Garage Control Commission is composed of the Mayor as chairman, four members of the Board of Aldermen, and four citizens appointed by the Mayor.

In all cities except Birmingham the garage building and site are owned by the city. Eighteen garages are constructed of brick, six of wood, three of sheet metal, and two of concrete. The larger proportion of the buildings are single-story. Detroit's garage is of modern concrete construction, three stories high, and is fire-proof throughout. The floor space

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*For an analysis of the uses of motor trucks by municipal departments, see the 1924 *Municipal Index*, Section 5.

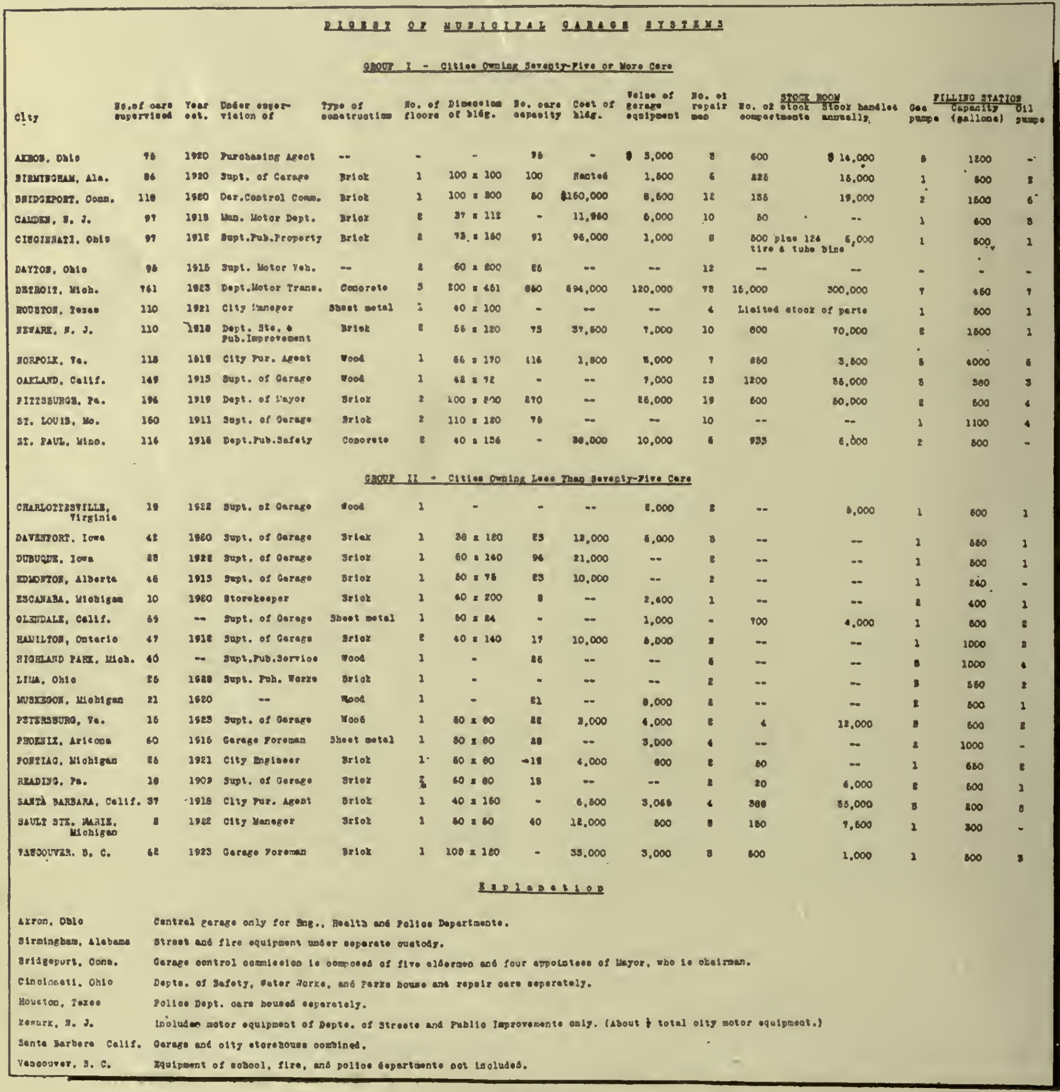
of the building indicates whether or not the garage also houses the cars when not in use. Garages with limited capacity serve only as a central repair and service station.

The majority of garages maintain small stock rooms for extra repair parts. Dayton, Ohio, and Dallas, Texas, are provided with revolving funds to finance purchases of stock in bulk when market conditions are favorable. Some cities located in a manufacturing or distribution center when delivery facilities are good do not stock repair parts in bulk. In some cases, experience has shown that the interest on money invested while stock is stored is equal to, or in excess of, the potential savings of bulk purchases in advance of need.

A central filling station may be a source of considerable economy. Practically every city maintains one, and in some the storage tanks permit purchase of gasoline in tank car lots. This facilitates a saving of several cents per gallon over purchase in retail quantity upon need.

Other Cities Establishing Garages

Other cities are just now establishing centralized control over motor vehicles. Milwaukee is considering such a project for the current year. Dallas has just completed a municipal garage, filling-station, and repair shop to be under the supervision of the city purchasing agent. It is located on a railroad siding with storage tanks for handling car-loads of gasoline. The Board of Estimate and Apportionment of New York City recently appropriated $3,500,000 for the construction of a central



DIGEST OF MUNICIPAL GARAGE SYSTEMS

GROUP I - Cities Owning Seventy-Five or More Cars

City	No. of cars supervised	Year est.	Under supervision of	Type of construction	No. of floors	Dimension of bldg.	No. cars capacity	Cost of bldg.	Value of garage equipment	No. of repair men	STOCK ROOM No. of stock compartments	STOCK ROOM Stock handled annually	FILLING STATION Gas pumps	FILLING STATION Capacity (gallons)	FILLING STATION Oil pumps
AKRON, Ohio	75	1920	Purchasing Agent	--	-	-	75	-	$ 3,000	3	600	$ 14,000	5	1200	-
BIRMINGHAM, Ala.	86	1920	Supt. of Garage	Brick	1	100 x 100	100	Rented	1,500	5	225	15,000	1	500	2
BRIDGEPORT, Conn.	118	1920	Gar. Control Comm.	Brick	1	100 x 200	80	$160,000	8,500	12	155	19,000	2	1500	6
CAMDEN, N. J.	97	1918	Mun. Motor Dept.	Brick	2	37 x 112	-	11,960	6,000	10	50	--	1	600	3
CINCINNATI, Ohio	97	1912	Supt. Pub. Property	Brick	2	72 x 160	91	96,000	1,000	8	500 plus 124 tire & tube bins	6,000	1	500	1
DAYTON, Ohio	98	1915	Supt. Motor Veh.	--	2	60 x 200	25	--	--	12	--	--	-	-	-
DETROIT, Mich.	761	1923	Dept. Motor Trans.	Concrete	3	200 x 451	650	694,000	120,000	78	15,000	300,000	7	450	7
HOUSTON, Texas	110	1921	City Manager	Sheet metal	1	40 x 100	-	--	--	4	Limited stock of parts		1	500	1
NEWARK, N. J.	110	1918	Dept. Sts. & Pub. Improvement	Brick	2	56 x 120	75	37,500	7,000	10	600	70,000	2	1500	1
NORFOLK, Va.	118	1919	City Pur. Agent	Wood	1	66 x 170	116	1,800	8,000	7	850	3,500	5	4000	6
OAKLAND, Calif.	149	1913	Supt. of Garage	Wood	1	42 x 72	-	--	7,000	23	1200	55,000	3	360	3
PITTSBURGH, Pa.	196	1919	Dept. of Mayor	Brick	2	100 x 200	270	--	26,000	19	600	80,000	2	600	4
ST. LOUIS, Mo.	160	1911	Supt. of Garage	Brick	2	110 x 120	75	--	--	10	--	--	1	1100	4
ST. PAUL, Minn.	116	1916	Dept. Pub. Safety	Concrete	2	40 x 136	-	38,000	10,000	6	933	6,000	2	500	-

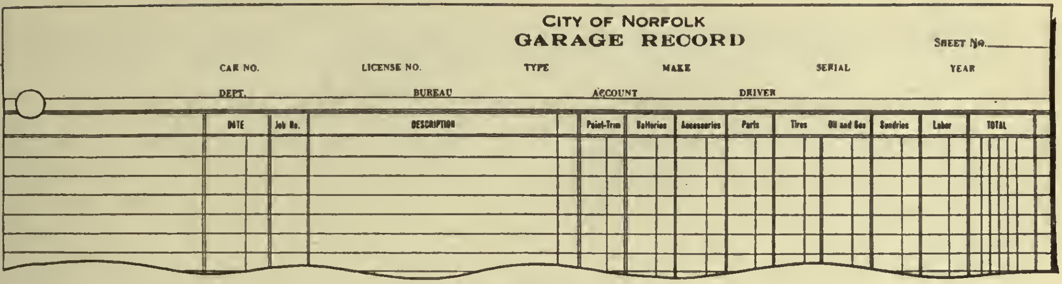
GROUP II - Cities Owning Less Than Seventy-Five Cars

City	No. of cars supervised	Year est.	Under supervision of	Type of construction	No. of floors	Dimension of bldg.	No. cars capacity	Cost of bldg.	Value of garage equipment	No. of repair men	STOCK ROOM No. of stock compartments	STOCK ROOM Stock handled annually	FILLING STATION Gas pumps	FILLING STATION Capacity (gallons)	FILLING STATION Oil pumps
CHARLOTTESVILLE, Virginia	19	1922	Supt. of Garage	Wood	1	-	-	--	2,000	2	--	5,000	1	500	1
DAVENPORT, Iowa	42	1920	Supt. of Garage	Brick	1	38 x 120	23	12,000	6,000	3	--	--	1	550	1
DUBUQUE, Iowa	28	1922	Supt. of Garage	Brick	1	60 x 140	96	21,000	--	2	--	--	1	500	1
EDMONTON, Alberta	46	1913	Supt. of Garage	Brick	1	80 x 75	23	10,000	--	2	--	--	1	240	-
ESCANABA, Michigan	10	1920	Storekeeper	Brick	1	40 x 200	8	--	2,400	1	--	--	2	400	1
GLENDALE, Calif.	69	--	Supt. of Garage	Sheet metal	1	60 x 24	-	--	1,000	-	700	4,000	1	600	2
HAMILTON, Ontario	47	1912	Supt. of Garage	Brick	2	40 x 140	17	10,000	5,000	3	--	--	1	1000	3
HIGHLAND PARK, Mich.	40	--	Supt. Pub. Service	Wood	1	-	26	--	--	5	--	--	8	1000	4
LIMA, Ohio	25	1922	Supt. Pub. Works	Brick	1	-	-	--	--	2	--	--	3	550	2
MUSKEGON, Michigan	21	1920	--	Wood	1	-	21	--	8,000	2	--	--	2	500	1
PETERSBURG, Va.	15	1923	Supt. of Garage	Wood	1	60 x 60	22	2,000	4,000	2	4	12,000	3	600	2
PHOENIX, Arizona	60	1916	Garage Foreman	Sheet metal	1	30 x 60	28	--	3,000	4	--	--	2	1000	-
PONTIAC, Michigan	25	1921	City Engineer	Brick	1	60 x 60	18	4,000	600	2	50	--	1	650	2
READING, Pa.	18	1909	Supt. of Garage	Brick	½	60 x 60	18	--	--	2	20	6,000	2	600	1
SANTA BARBARA, Calif.	37	1918	City Pur. Agent	Brick	1	40 x 160	-	6,500	3,064	4	388	55,000	3	200	3
SAULT STE. MARIE, Michigan	8	1922	City Manager	Brick	1	50 x 50	40	12,000	500	8	150	7,500	1	300	-
VANCOUVER, B. C.	62	1923	Garage Foreman	Brick	1	100 x 120	-	35,000	3,000	3	500	1,000	1	500	3

Explanation

Akron, Ohio	Central garage only for Eng., Health and Police Departments.
Birmingham, Alabama	Street and fire equipment under separate custody.
Bridgeport, Conn.	Garage control commission is composed of five aldermen and four appointees of Mayor, who is chairman.
Cincinnati, Ohio	Depts. of Safety, Water Works, and Parks house and repair cars separately.
Houston, Texas	Police Dept. cars housed separately.
Newark, N. J.	Includes motor equipment of Depts. of Streets and Public Improvements only. (About ½ total city motor equipment.)
Santa Barbara Calif.	Garage and city storehouse combined.
Vancouver, B. C.	Equipment of school, fire, and police departments not included.

FIGURE 1



CITY OF NORFOLK
GARAGE RECORD

SHEET No.____

CAR NO. LICENSE NO. TYPE MAKE SERIAL YEAR

DEPT. BUREAU ACCOUNT DRIVER

	DATE	Job No.	DESCRIPTION	Paint-Trim	Batteries	Accessories	Parts	Tires	Oil and Gas	Sundries	Labor	TOTAL

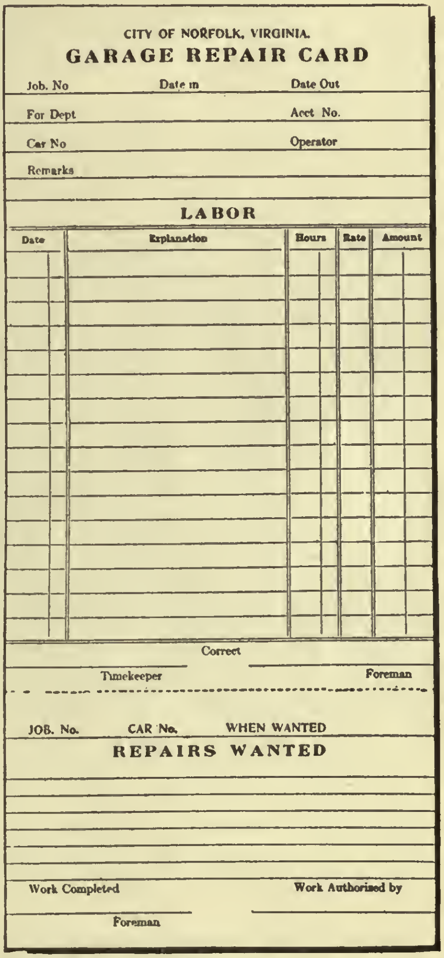
FIGURE 2

motor repair shop, to be under the supervision of the Department of Street Cleaning, but available for use by all departments of the city government. Nineteen departments, operating in all over 3,000 vehicles, urged the appropriation for a central repair shop to supersede the 28 shops at present controlled by them and now scattered throughout the city. Central control over automotive equipment is a "going" subject in municipal government today.

Representative Systems of Administration

The writer has had opportunity to inspect personally several different systems of administration of municipal garages in the cities covered in this report. The city of Norfolk, Va., operates 118 motor cars through the municipal garage under supervision of the city purchasing department. An accurate cost record is kept for each car during each current fiscal year and for its entire life. Each car is assigned a page in the accounting ledger. The *repair card* reproduced herewith (*Figure* 3) allocates the repair cost of the specific car, to its using department, and to its operator. This serves as an index to the efficiency of each driver and checks carelessness. The card is certified by the timekeeper, by the garage foreman, and by the head of the department ordering the repair.

The *garage record* (Figure 2) constitutes each car's expense account with the city. The job number ties up each entry with its repair card, which is duly certified by the proper authorities. Expenses are allocated to paint-trim, batteries, accessories, parts, tires, oil and gas, sundries, and labor. The total column shows at a glance the total up-keep cost for each car to date in the fiscal year. It indicates when a car has served its usefulness and should be traded in or replaced.



CITY OF NORFOLK, VIRGINIA.
GARAGE REPAIR CARD

Job. No Date in Date Out

For Dept Acct No.

Car No Operator

Remarks

LABOR

Date	Explanation	Hours	Rate	Amount

Correct

Timekeeper Foreman

JOB. No. CAR No. WHEN WANTED

REPAIRS WANTED

Work Completed Work Authorised by

Foreman

FIGURE 3

The municipal garage of Birmingham, Ala., exercises even closer control over the city's motor equipment. All cars, except those of the street and fire departments, are housed in the municipal garage when not in use. Each car "punches out" in the morning and "punches in" at night. The garage keeps a daily report of all city-owned cars. The car is identified by its number and by the department to which it is assigned. The speedometer reading is taken when the car leaves and again when it returns, and the mileage is recorded, as well as the gas and oil issued to it. Each driver reports on a regular form any trouble noted or repair needed. A cost ledger sheet is kept for each car, as at Norfolk, and the up-keep is charged to the respective departments. A flat rate of $1 per hour is charged for repair work, which covers salaries, overhead charges for operation of garage, and all expenses other than repair material, which is charged extra. A report is made on each battery every ten days. Every car is inspected daily and serviced by an attendant at night, who also acts as watchman. Repair parts are kept in a small storeroom, which is financed from a municipal stores revolving fund. During the past year an amount equal to the pay-roll of the garage was saved in wholesale discounts on Ford parts alone.

In the city of Houston, Texas, the municipal garage is operated under direct supervision of the city manager. A total of 110 cars are operated out of the garage, which includes all belonging to the city except those of the police and fire departments. Two mechanics and one helper are on the pay-roll. The garage was operated last year for an average monthly cost of $372, which included salaries and overhead. By conducting a central filling-station, gasoline and oil are purchased in large quantities at wholesale prices, for an average saving of 4 cents per gallon on gasoline and 50 cents per gallon on lubricating oil. Tubes are vulcanized at an average cost of 3 cents per job. To recharge a battery costs the city on an average of 20 cents. To rebuild a battery costs about $9, while commercial concerns make an average charge of $16 per job. The municipal garage was constructed under a viaduct at a cost almost negligible. Its operation means an estimated annual saving to the city of over $20,000 by reducing repair and housing cost, by encouraging greater care in driving and in maintenance, and by eliminating "joy-riding" at the city's expense through a strict surveillance of mileage.

This is the "motor age" in city government. The cost of motor equipment and the expense of its maintenance is a considerable item in the annual budget of most cities to-day. The success already attained by several cities demonstrates that centralized control over motor equipment is a leading means for keeping the up-keep down.

ACKNOWLEDGMENT.—For the foregoing article THE AMERICAN CITY is indebted to *The Purchasing Agent*, which is publishing the same material in its October issue.

There Were Speeders Even in Those Days

THE problem of fast traffic is by no means a new one. Those who have been to Pompeii are acquainted with the blocks across the streets which served the double purpose of keeping the chariots to a reasonable pace and the feet of the pedestrians dry when they crossed the road. In this country, a Newport correspondent claims for Rhode Island the credit of having been the first to pass a traffic ordinance. This occurred in June, 1678, the resolution of the Assembly of the Colony reading as follows:

"Whereas, there was very lately in the town of Newport on Rhode Island very great hurte done to a small childe by reason of exceeding fast and hard ridinge of horses in said town, this Assembly takeing the matter into their searious consideration and being desirous for the future to prevent the like mischief, doe ordain, et cetera——that from and after the publication hereof, if any person or persons shall presume to ride on either horse, mare or gelding, a gallup or to run speed—in the streets of Newport—said person shall for his offence pay—unto the Treasurer of said towne 5 shillings in money on demand; 2 shillings of which shall be paid to any person or persons that shall give information thereof and the other 3 shillings to remaine for the use of the said towne."

And the Town Sergeant was immediately empowered by a special act to "take by distraint" the said 5 shillings if they were not immediately forthcoming.

It has been said that the curse of America is the desire for speed. If this is so, the curse is of ancient lineage. If barely 70 years after the first permanent settlement on our shores it was found necessary to legislate against "speed fiends," their currency to-day should not surprise us.

Road Mileage in the United States

THERE are now in the United States, according to the Federal Bureau of Public Roads, a total of 2,819,386 miles of rural highways. As nearly as it is possible to determine, the mileage of the various types of pavements is as follows: gravel, 175,000 miles; macadam, 100,000 miles; sheet asphalt, asphaltic concrete, asphalt block and asphalt macadam, 30,000 miles; portland cement concrete, 27,000 miles; brick, stone block and miscellaneous, 10,000 miles. Exclusive of sand-clay roads, there are now 340,000 miles of paved highways. Forty thousand miles of paved roads were constructed last year. The construction of asphalt roads during 1923 was greatly in excess of any previous year, there being laid 102,000,000 square yards of asphalt paving on the roads and streets of the country, compared to 82,700,000 square yards in 1922, and 68,000,000 square yards in 1921. The increase in the asphaltic types is due, according to the engineers, to recognition of the shock-absorbing and waterproofing characteristics of asphaltic compositions, which protect foundations from the impact of traffic and give them immunity from destruction through moisture and temperature changes at all times of the year.

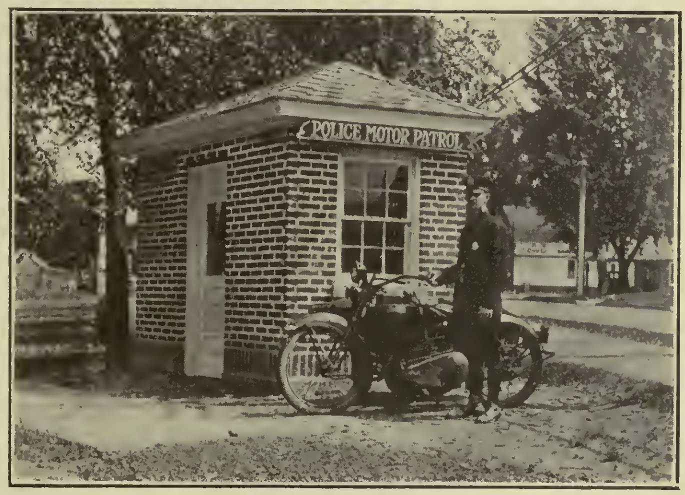
Combining Traffic and Patrol Service Without Increasing the Pay-Roll

By William A. Douglas
Commissioner of Public Safety, Utica, N. Y.

MODERN methods and more police efficiency per man are needed in many cities to cope with the modern criminal and with the reckless motorist, who is just as deadly and who scores more frequently than the gunman. Utica has recently witnessed within its paved circumference some highway crimes of a violent character made possible by the extension of its park system into an area without adequate police patrol. The problem was to increase the efficiency of the individual officer without adding numerical strength beyond the city's resources and without establishing a fully manned and costly precinct system. During the last six months, these problems in Utica have been solved or are in the process of solution.

The paved area encircling the city of Utica has a length of about eighteen miles. To shelter motor-cycle officers engaged on boundary patrol, outposts or stations of tapestry brick construction and ornamental design, ten feet square and ten feet high to peak of roof, have been located at a fraction more than three miles apart at strategic points. Gold lettering on blue background identifies them to the passing public as "Police Motor Patrol." Each station has a desk, a chair, a police blotter, an electric light, an electric heater, and a telephone having no direct communication other than with headquarters.

The station is occupied during daylight hours by a foot patrolman. The night patrol begins moving at eight o'clock and the system calls for a motor-cycle officer at each station at that hour. At the same hour, a sixth motor-cycle officer reports at station 1 and begins a tour of the city boundary. He passes each station and reports to headquarters from each of the five occupied stations during the hour needed for the tour of the city's circumference. He then finishes his tour one station beyond the complete circle, there relieving the motor-cycle officer at station 2. The motor officer at station 2 thereupon resumes the boundary patrol, passing and reporting as before, and ending his tour at station 3, where the patrol is resumed by the motor officer at that station, thus rotating and relieving each officer in turn during the night hours. City streets paralleling the boundary line and within measurable distance are also covered by the motor patrol, thus relieving foot patrolmen in the outlying districts for work nearer the congested parts of the city's night life.



POLICE MOTOR PATROL STATION
The motor-cycles used are of three makes: Harley-Davidson, Indian and Henderson

The system provides immediate communication between headquarters and each avenue of escape from the city. Telephone wires between patrol stations and headquarters are buried in cable conduits, thus protecting the wire service from outside attack. So far as the writer can learn, Utica is the only city having a boundary motor patrol in operation.

The time when our residential neighbor went to his front gate to hail a blue uniform has passed and the value of the daylight patrolman in residential districts has passed with it. Calls for police service in our generation are telephone calls direct to headquarters, and the problem is to dispatch prompt relief. A reserve force at headquarters is not always available to answer the many daylight complaints, mostly of a trivial nature, in the residential sections. Under the old system, the foot patrolman on the beat may be a mile or more from a police box, and the complaint reaches him when he rings in a half hour or more later. Under the new system which is being installed in Utica, the patrolling officer is stationed in daylight at the busiest street intersection on his beat. He thus becomes a traffic officer, but at this same point is a signal whereby he can be reached instantly from headquarters and given complaints to answer from any part of his beat. This combines traffic service and quick patrol service, and doubles the output of the individual police officer without increasing the police pay-roll.

Another minor detail of police service, much appreciated by the trolley traveling public, has been adopted in Utica between the hours of five and seven o'clock in the evening at busy street intersections in residential districts where trolleys are discharging passengers returning from work. This consists of the holding back by the patrolman of motor traffic at safety zones until cleared of passengers, it being self-evident that the sidewalk is the real safety zone and the quicker the pedestrian is out of the traffic area the quicker he is out of danger.

Personal Liability of Health Officials

By James A. Tobey, M. S., LL.B.

Administrative Secretary, National Health Council, New York

PUBLIC officials are often concerned about the extent of their own personal liability for acts done in the course of their official duties. In many states legislation governing such liability is in existence, and public officials should, of course, familiarize themselves with it. The courts have also rendered numerous decisions on this subject, and these express the law. It is the function of the courts to interpret and secure justice under the laws as promulgated by the legislative branch of government and enforced by the executive. The courts can render opinions, however, only in cases actually brought before them by aggrieved persons. Where there is no legislation, the principles of the common law are applied.

Officers of a municipal corporation are not liable, according to Dillon,[1] for errors or mistakes of judgment in the performance of acts within the scope of their authority as to which they are empowered to exercise judgment and discretion in the manner of their performance, in the absence of malice or corruption or a statutory provision imposing the liability. The following discussion is concerned primarily with health officials, but the principles involved apply with equal force to other officials acting in a governmental capacity.

A health official is an administrative or ministerial officer, the agent of the government he represents, and as such has many quasi-judicial functions. He cannot be held individually liable for any act which is essential for the protection of the health of the public, but in performing his duties he must be reasonable and prudent. For a mere error of judgment he will not be held liable, but if he is unreasonable, arbitrary, oppressive, or malicious in doing his work and thus causes injuries to persons, or property, he will be liable.[2]

As an example of a reasonable exercise of power by a health officer, there may be cited mistakes of quarantine. Where an individual was isolated under the belief that he had smallpox, though as a matter of fact he did not have it, members of the local board of health were held by the highest court of Iowa not to be liable for this error.[3] So too, a health officer in New Jersey was held not personally liable for quarantining for scarlet fever after four physicians had diagnosed it as such, though it turned out not to be this disease.[4]

An early (1874) Maine case held that an owner could not recover from a health officer who had compelled him to remove the wallpaper from a room where a smallpox patient had been confined, although considerable evidence was introduced to the effect that such removal was unnecessary.[5] It is possible that such a requirement to-day, in light of our modern knowledge, would be held unreasonable. However, the general rule of law would be the same.

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[1] Dillon's "Municipal Corporations," page 771.

[2] Crayton v. Larabee, 220 N. Y. 493, 116 N. E. 355, L. R. A. 1918 E. 432. Bellows v. Raynor, 207 N. Y. 389, 101 N. E. 181. Raymond v. Fish, 51 Conn. 80, 50 Am. R. 3. See also note, 24 A. L. R. 794.

[3] Beeks v. Dickenson County, 131 Ia. 444, 108 N. W. 311, 6 L. R. A. (N. S.) 831, 9 Ann. Cas. 812.

[4] Valentine v. Englewood, 76 N. J. L. 509, 71 Atl. 344, 19 L. R. A. (N. S.) 262, 16 Ann. Cas. 731, and see Forbes v. Escambia County Board of Health, 28 Fla. 26, 9 So. 862, 13 L. R. A. 549.

Other cases have held no liability for failure to remove a smallpox patient from a house,[6] for quarantine of a vessel on account of the prevalence of disease at the port,[7] for fumigating a millinery shop,[8] for failure to provide a nurse as required by law,[9] and for the exclusion of an unvaccinated child from school.[10] So, too, where a health officer merely carries out the orders of his board he is not liable.[11] But where a health officer was negligent in quarantining patients in a tent in cold, damp weather, so as to aggravate their disease and cause death, he is liable.[12] In a recent Kansas case, it was said by the Court: "The law, no less than humanity, requires humane and decent treatment of those who must be segregated from their usual conveniences and friends, and whoever acts with utter disregard of this requirement renders himself liable."[13]

When a health officer does acts in excess of his authority, he is generally liable as an individual. For instance, a recent (1921) Michigan case held that a health officer was liable in damages for causing a girl to be examined for venereal disease, although he did not have reasonable grounds for believing that she was infected. It turned out, as a matter of fact, that she did have gonorrhea, but the court maintained that there was no legal justification for the examination, as there was no testimony showing good faith on the part of the health officer.[14] A president of a board of health was held personally liable for arbitrarily ordering fumigation of a vessel, although it had a clean bill of health and had not come from an infected port.[15] Health officials have also been held liable for injuries during the unauthorized use of a dwelling as a hospital,[16] for unwarranted flooding of land,[17] and for neglect in preventing the sale of impure milk.[18]

When a health officer destroys property under the belief that it may be dangerous to health, but as a matter of fact, it is not and could by no means be reasonably so considered, he is liable.[19] As was remarked in a New York case, "Whoever abates a nuisance, unless acting under court order, does so at his peril and must prove the nuisance."[20] In 1890 in Massachusetts, the members of a board of health ordered certain horses to be killed on the supposition that they had glanders. It turned out that they did not have this disease, and the members were held liable. It was their business to ascertain the exact facts and they were negligent in not doing so.[21] In a similar connection, live stock commissioners were liable for the destruction of healthy cattle by mistake.[22]

Health officers, like all other public officers, are not ordinarily individually responsible for the negligence of those whom they are obliged to employ. If, however, the fault of the subordinate is due to the connivance of the superior, the latter may be held liable. The health officer is never personally liable for contracts which he is authorized to make, and is not liable on *ultra vires* contracts, provided there is no fraud or actual deception.[23] It is a well-known rule of law that the municipality itself is never liable for the acts of its officers when performing governmental functions.

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[5] Seavey v. Preble, 64 Me. 120.

[6] Whidden v. Cheever, 69 N. H. 142, 44 Atl. 908, 76 Am. S. R. 154.

[7] Compagnie Française de Navigation a Vapeur v. State Board of Health, 51 La. Ann. 645, 25 So. 591, 56 L. R. A. 795, 72 Am. S. R. 458.

[8] Allison v. Cash, 143 Ky. 679, 137 S. W. 245.

[9] Rohn v. Osmun, 143 Mich. 68, 106 N. W. 697, 5 L. R. A. (N. S.) 635.

[10] Zucht v. King, 225 S. W. 267, affirmed 260 U. S. 174.

[11] Kirby v. Harker, 143 Ia. 478, 121 N. W. 1071.

[12] Aaron v. Broiles, 64 Tex. 316, 53 Am. Rep. 764.

[13] Moody v. Wickersham, 111 Kan. 770, 207 P. 847, 24 A. L. R. 794.

[14] Rock v. Carney, 216 Mich. 280, 185 N. W. 798, 22 A. L. R. 1178.

[15] Beers v. Board of Health, 25 La. Ann. 1132, 48 Am. Rep. 256.

[16] Brown v. Murdock, 140 Mass. 314, 3 N. E. 208; Hersey v. Chapin, 162 Mass. 176, 38 N. E. 442; Barry v. Smith, 191 Mass. 78, 77 N. E. 1099, 5 L. R. A. (N. S.) 1028. But no liability where owner executes a lease: Sallinger v. Smith, 192 Mass. 317, 78 N. E. 479.

[17] Overmyer v. Barnett, 70 Ind. App. 569, 123 N. E. 654.

[18] McKenzie v. Royal Dairy, 35 Wash. 390.

[19] Lowe v. Conroy, 120 Wis. 151, 97 N. W. 942, 66 L. R. A. 907, 102 Am. S. R. 983, 1 Ann. Cas. 341.

[20] People ex rel. Copcutt v. Board of Health, 140 N. Y. 1, 35 N. E. 320, 23 L. R. A. 481, 37 Am. S. R. 522.

[21] Miller v. Horton, 152 Mass. 540, 26 N. E. 100, 10 L. R. A. 116, 23 Am. S. R. 850.

[22] Pearson v. Zehr, 138 Ill. 48, 29 N. E. 854, 32 Am. S. R. 113.

[23] 1 Dillon, Municipal Corporations, 776.

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Pictures Arouse City Planning Emulation

TYPE OF BUILDINGS THAT PROPOSED STREET BETWEEN MAIN STREET AND COLUMBUS AVENUE, SPRINGFIELD, WOULD GO THROUGH

THE PROPOSED STREET WOULD MAKE A WONDERFUL APPROACH TO SPRINGFIELD'S CAMPANILE

THE recently published City Plan for Springfield, Mass., is an excellent example of the effective use of local pictures and maps, in combination with views from other cities, to stimulate public approval of a city planning program.

The report consists of thirteen chapters, each of which contains numerous definite recommendations as to procedure. These chapter headings are: The Plan; Building Zones (Municipal Control of the Use of Private Property); Railroads; Thoroughfares and Parkways; Transit, Street Cars and Busses; Downtown Traffic; Water-Front Development; Parks and Reservations; Playgrounds and Recreation; Distribution of Schools and Other Public Buildings; Civic Center; Civic, Educational, and Art Center; Tax Equalization.

In making available for the readers of THE AMERICAN CITY the half-tone illustrations here shown, J. T. Woodruff, Engineer-Secretary of the Planning Board, cites the following important accomplishments *since the printing of the report:*

PARKS

Oak Grove Park purchased; 221 acres.

Mill River Park.—Part of this land near Locust Street given for park.

Eastern Extension of Forest Park.—About 48 acres given to city for park.

Watershops Pond Park.—About 600 feet frontage given to city as start of this project.

Atwater Park.—108 acres given to city. Now pending action of Chicopee City Government.

Dimmock Pond Park.—Given for park by Ludlow Manufacturing Associates.

PARKWAYS

Riverfront Parkway.—Appropriation passed for acquisition of land from Chicopee to West Street, a distance of about one mile, or nearly one-quarter of whole river frontage.

Garland Terrace, Gifford Street and Winnipeg Street Parkway.—This street layout accepted by Board of Survey and plans filed.

Pearl Street to Bridge Street diagonal cut-off and widening.

THOROUGHFARE EXTENSIONS

Extension of Plumtree Road to Wilbraham Road.

State Street widening of roadway, Main to Chestnut Street.

Chestnut Street widening from Taylor to Lyman Street.

Winter Street to be extended.

Building line on Oakland Street, Belmont Avenue to Allen Street.

Downtown traffic control by one-way street method, as shown in Chapter VI, adopted by city and in effect.

Corners of Orange and Oakland Streets cut back and rounded to lessen accident danger.

SCHOOLS

New school to be erected near Hancock and Hickory Streets.

New $225,000 Central Street Junior High School project abandoned because Planning Board study showed it to be unnecessary.

FIRE-STATIONS

New fire-station located and under construction in high-value district.

SPRINGFIELD NOW GETS NO VISTA OF THE CAMPANILE

SKETCH SHOWING VISTA IF PROJECT IS CARRIED OUT

THAMES, LONDON, RIVER FRONT

A RIVER WALL AT BUDAPEST

THE RIVER FRONT AS A SETTING FOR PUBLIC BUILDINGS

RIVER FRONT PROMENADE, BUDAPEST

PLEASURE USE OF THAMES AT HAMPTON COURT, LONDON

A PLAN EXECUTED—PRAGUE FROM THE RIVER

A RIVER WALL IN PARIS

A RIVER FRONT PROMENADE AT BRATSLAV

For the illustrations on this and the preceding page, THE AMERICAN CITY *is indebted to the Planning Board of Springfield, Mass.; Technical Advisory Corporation, consulting engineers; Frederick Law Olmsted, special adviser*

Forward Steps in City and County

New Municipal Building Houses Town and Village Offices and Police and Fire Departments

St. Johnsbury, Vt.—This village of some 7,000 population, now in its second year under a municipal manager, has erected a municipal building costing $53,000 exclusive of the land. It is a two-story brick structure of fire-proof construction, with reinforced concrete and granite trimmings. The ground dimensions are 60 by 75 feet and the lot was bought for $15,000.

The northern half of the building is devoted entirely to the fire department, whose equipment consists of a motor chemical truck, a motor hook and ladder truck, and a motor truck for surplus hose. The big room on the first floor has a floor of reinforced cement, the doors open automatically, and in the rear of the room is the office of the chief. On the second floor is a large recreation room, measuring about 30 x 60 feet, for the paid department of six members, with a pool table, a victrola, easy chairs and the current magazines. In the center of this room is the brass pole so essential for a quick getaway. In the rear are the sleeping quarters, equipped with shower-baths and all modern conveniences.

ST. JOHNSBURY'S NEW MUNICIPAL BUILDING

The south side of the first floor is occupied by the town clerk and treasurer and his two assistants. Here there is a fire-proof vault, 12 x 16 feet and 20 feet high, built of reinforced concrete and solid steel. Back of these offices are the police headquarters. The village lock-up has been given up and now all prisoners are kept in the county jail only a short distance from the municipal building.

A broad stairway at the front and on the right of the first floor corridor leads to the second floor, where are the offices of Town Manager Ralph D. Sherry, a room for the Red Cross, and several suites of offices, one of which has already been rented for commercial purposes. The basement contains the heating apparatus, a spare vault for storing town records which extend back nearly 150 years, and a large room for drying the fire hose.

Aside from the big room containing the fire apparatus, the interior is finished in hard pine stained to represent gumwood, with hardwood floors.

Before the municipal building was erected, the police headquarters were in one portion of the village, the fire department on leased land in another place, and the town and village offices in a third block. Now they are all under one roof in a building which is a credit to the community.

ARTHUR F. STONE.

Warehouse Rehabilitated as Municipal Building

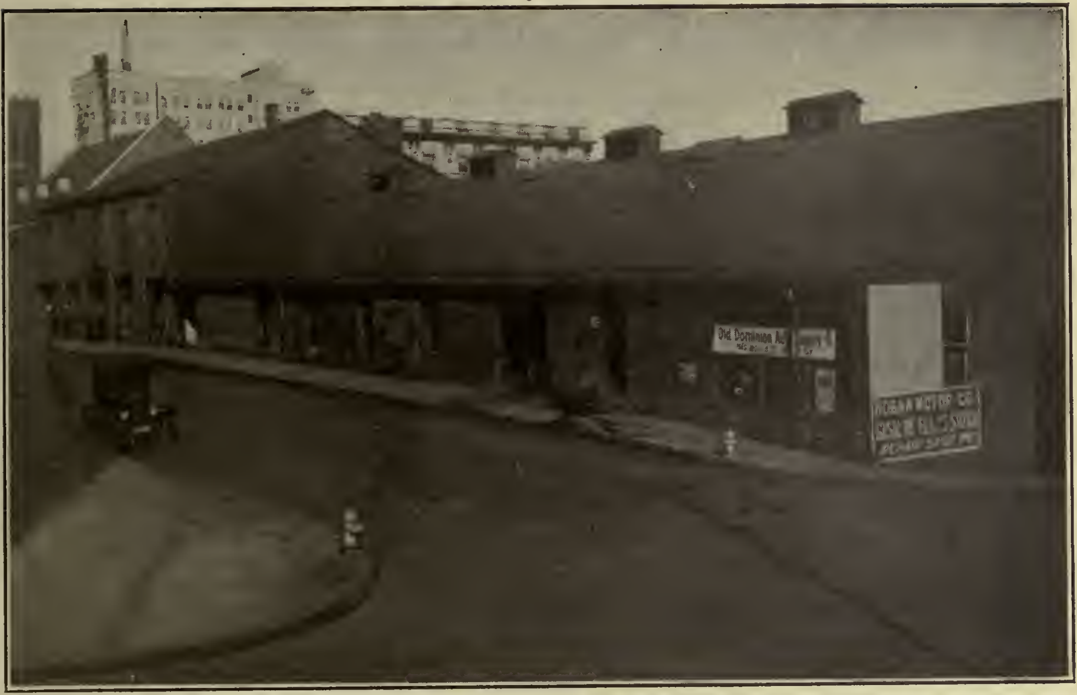
Lynchburg, Va.—Prior to the year 1923 the municipal offices of Lynchburg were situated in several widely scattered locations throughout the city—with obvious disadvantages, especially in costly maintenance and in lack of co-ordination.

Thirty-four years ago nearly one-half of a city block, known as the Friends Warehouse property, was purchased by the city and used for a storage and junk yard. Later, part of the property was used as a fire station and the rest was rented. The erection of a city hall on this property has been occasionally agitated since that time.

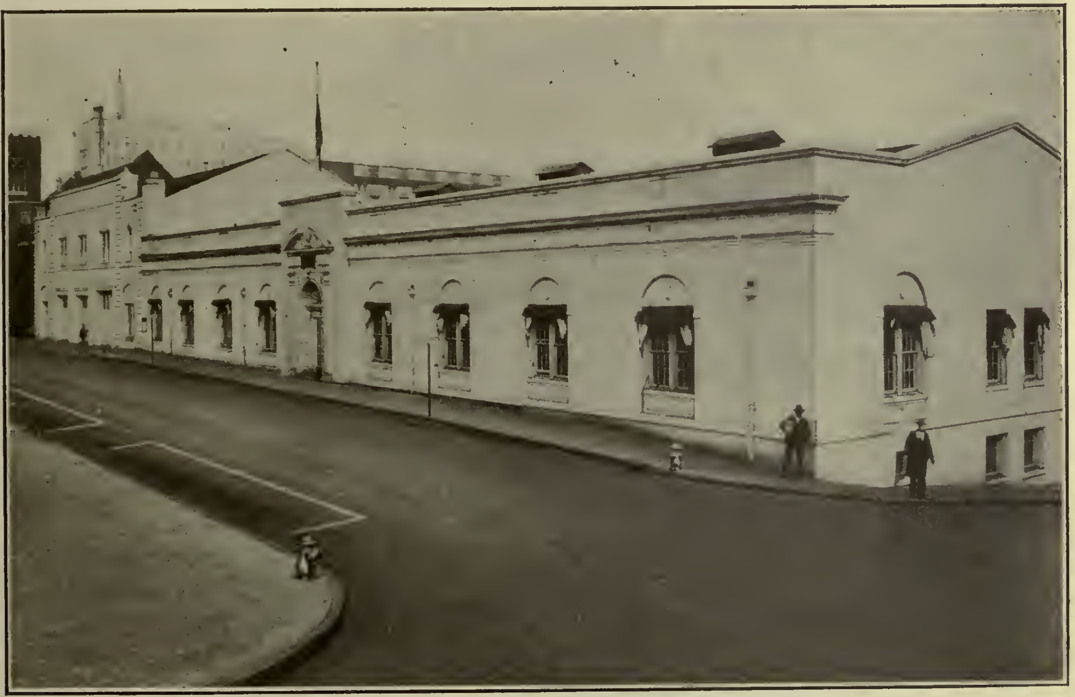
Recently Lynchburg adopted the city manager form of government, and its affairs have been administered on a strictly conservative basis. Although a yearly construction program of about a quarter-million dollars has been carried out, this along with general operating expenses has been financed from current revenues. This condition is mentioned to give the proper slant on Lynchburg's mental attitude.

Advocates of a costly municipal building were confronted with the question of whether the city would be justified in issuing several hundred thousand dollars of bonds for such a structure, and by so doing increase the annual outlays some $15,000 to $25,000 to provide interest and upkeep, aside from sinking fund requirements; or whether there was justification for curtailing a much-needed program of street, sewer and sidewalk improvements, which would be necessary were such a project financed from current revenues.

Instead of adopting either alternative, it was decided, on recommendation of the City Manager, to rehabilitate the old Friends Warehouse. Accordingly, plans were drawn up and work commenced late in November, 1922. Construction was sufficiently completed to permit all administrative offices, except the Public Welfare and Police De-



FRIENDS WAREHOUSE AND FIRE STATION NO. 3, LYNCHBURG, VA., BEFORE ALTERATION



THE COMPLETED MUNICIPAL BUILDING IN LYNCHBURG partments, to occupy the new quarters in February following. The No. 3 Fire Station was also completely remodelled, the basement of which, formerly a storage cellar, blacksmith shop and junk yard, now houses the Municipal Court, several offices and the detention cells.

Plans for the two-story building were prepared by a local architect. A local contractor furnished his labor organization and equipment. All materials were furnished by the city, and the construction was supervised by the Department of Public Works.

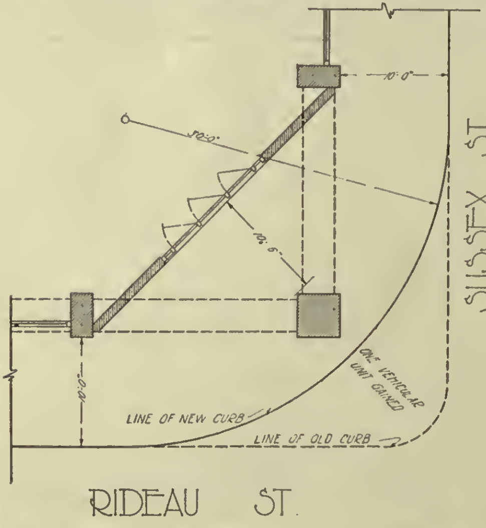
Besides the boiler- and fuel-rooms, fire-proof vaults, battery room and fire- and police-signal room, over forty other offices have been provided.

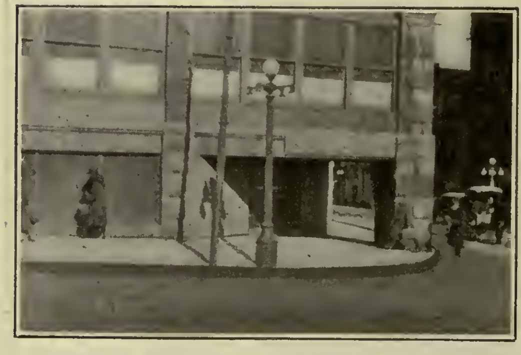
R. W. B. HART,
Director of Public Works.

Rounding of Business Corners to Provide Traffic Relief

OTTAWA, ONT.—A difficult situation, herewith illustrated, at the corner of Rideau and Sussex Streets, Ottawa, may be of interest to town planners and civic authorities. In this case, a very much needed widening of a traffic artery could be obtained only by bringing the curb up to the corner pier of the Daly Building.

Arrangements were made to obtain alterations in the building on the ground floor at this corner, so as to admit of passing the sidewalk within the building, behind the corner pier. The result has proved very satisfactory and the work has not been expensive, comparatively speaking.





CORNER ROUNDED BY PASSING SIDEWALK WITHIN THE BUILDING

The method adopted was the only means whereby this improvement could be obtained short of the enormous expenditure of expropriating the corner of a large office building. The Ottawa Plan Commission has other business corners in view for similar treatment, some of which are under negotiation.

Work of this kind, as a beginning of town planning relief, is proving of great value in convincing the business element of the city that town planning is a practical and economic method of advancing business interests, as well as making the town a better place for home interests and values.

In all new subdivisions of land the Ottawa Plan Commission is insisting upon provisions being made in the layout for the rounding of corners.

JOHN M. KITCHEN,
Office of Town Planning Commission, City Hall.

A Traffic School for Violators of Traffic Rules

KANSAS CITY, KANS.—In the summer of 1923 this city was hit by an epidemic known as the "speed craze." Hundreds of people were brought into the police court and fined, with practically no results. One day a young man came to my office wanting to know what he had been fined for. His attention was called to a certain section of the city ordinance, and a pamphlet containing the ordinance was handed him to read. He asked for permission to take the pamphlet with him. I then concluded that hundreds of speeders violated the ordinance, not through wilfulness, but through ignorance. This suggested the idea of getting as many people as possible to read the ordinances. When a speeder was brought into court, and when after hearing the evidence I found that no one was injured nor any property damage sustained and that the violation was the result of ignorance, I would continue the speeder's case for a week or ten days. During that period I would require the speeder to look up the statistics on insurance rates, the number of people killed and injured, the number confined in hospitals, the amount of money spent for graves and funerals, and would give him a pamphlet containing the traffic ordinance to study. When his case was again set for trial, he would be required to give me the information requested, and, under the instruction of a member of the Legal Department of the city, pass an examination on the ordinance. If it was shown that he had a clear conception of the ordinance and realized the seriousness of the situation, he would either be fined and paroled or his case continued pending good behavior.

On one occasion a traffic student, after passing a good examination, suggested that all violators be required to direct traffic under the supervision of a traffic officer. This was done, and as a result I was given a number of valuable ideas, from which I prepared for the press a list of "don'ts" for car drivers and pedestrians, which, together with the ordinance, were taught in the schools of this city.

The results, though not an absolute cure, have proved very satisfactory. I dare say there are more people in Kansas City, Kans. (120,000), who know the traffic ordinance and the responsibility of the car driver than in any other city of its size in the United States. During 1924 we have not had nearly the trouble with speeders that we had in 1923. Then all three of our metropolitan papers carried daily stories on the speeders and traffic violators; to-day two of the papers scarcely make any mention of the subject.

H. S. ROBERTS,
Police Judge.

Electrocution of Stray Dogs

To the Editor of THE AMERICAN CITY:

I notice in your August issue a little article on "A Proposed Municipal Program for Rabies Control."

We have a method here that we believe to be the first of its kind anywhere; I am quite sure it is the first of its kind in Georgia. We recently passed a very stringent dog ordinance, requiring all dogs to be inoculated against rabies and tagged. After a certain date all dogs caught without tags are sent to the city pound for dogs, held there four days, and then killed unless claimed by the owner. We have developed a unique method of impounding and killing. We built a pound with five compartments having concrete floors and well constructed. Each compartment has a tag and number; number five each day is the compartment containing dogs to be killed.

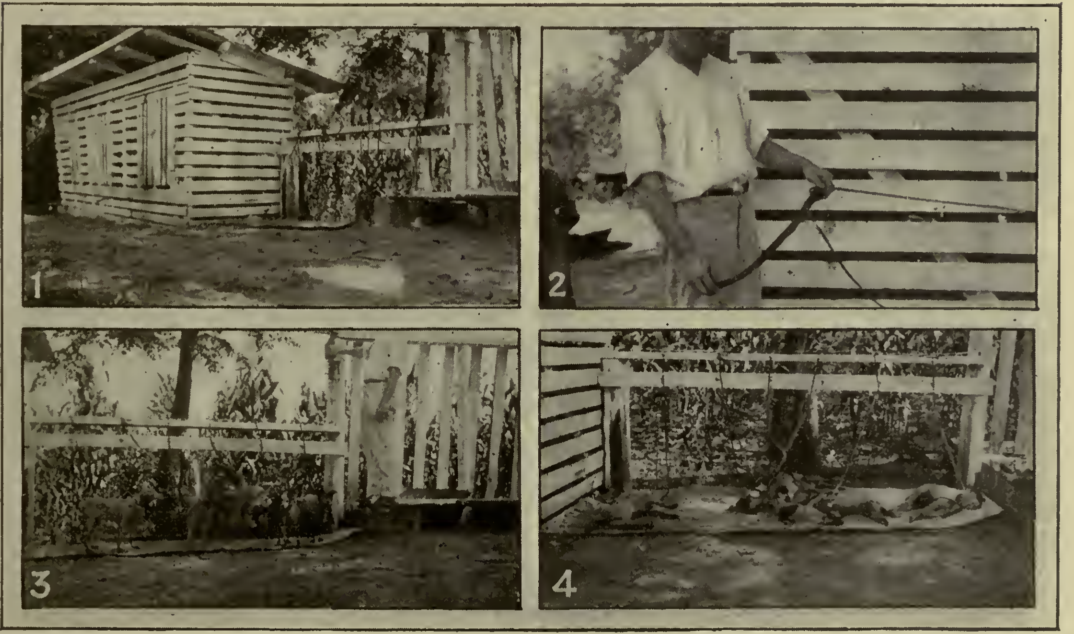
After some experimentation with the injection of strychnine and other poisons, we decided that electrocution was the quickest, most effective and least painful method of killing. We devised what might be called an electric chair of sufficient size to accommodate six dogs at a time. This device, developed by H. A. Miller, consists of a collar of copper brads that extend just far enough to make contact with the hide of the dog. The dog is wet with a garden hose just before the collar is clamped on, and stands on a metal sheet when the current is applied. Mr. Miller claims that the operation takes 1-180 millionth of a second to kill a dog; I am not prepared to dispute with him on this score.

We have killed 260 dogs on this outfit, and have inoculated and tagged 746. W. C. Howard, Superintendent, Sanitary Department, has direction of the pound and killing apparatus because of the fact that he operates the municipal incinerator, where the bodies of the dogs are burned.

This ordinance was adopted by the city, under the writer's suggestion and direction, on account of the prevailing rabies in other sections. Not a single case of rabies has been reported since we began enforcement.

W. AUSTIN SMITH,
City Manager.

Albany, Ga., August 19, 1924.



THE MERCIFUL EXECUTION OF UNCLAIMED DOGS
1. The detention house. 2. The collar by which the current is applied. 3. Before the current is turned on. 4. A few seconds later

Burning Oil Under Municipal Power-Plant Boilers

By W. F. Schaphorst, M. E.

OIL burning cannot cure all ills, hence municipal officials should not be overenthusiastic in installing oil-burning equipment. Oil burners cannot improve a boiler. All a burner can do is to improve combustion and generate more heat in the furnace per dollar. After the heat is generated the duty of the boiler is to absorb as much of the heat as possible. If the boiler is covered with soot or filled with scale it is no fault of the burner, and it is not likely that the boiler will perform any better with oil for fuel than with coal.

It is not always easy to compare the cost of oil with the cost of coal, because of the many factors that must be considered. Thus, to arrive at the actual cost of oil "in the furnace," the following items usually enter: purchase price; freight and demurrage; trucking; unloading and pumping; storage, pumping to burner system; possible leakage or other losses; heating in burner system; maintenance; air or steam for combustion; interest and depreciation on the entire outlay; insurance and boiler-room labor. Similarly, when computing the cost of coal, all items involved in getting the coal "into the furnace" must be included.

An approximate rule, which is easy to remember, is "Divide the cost of coal in dollars per long ton (2,240 lbs.) by 2. If the result is greater than the cost of oil in cents per gallon it will pay to burn oil." This rule should not be depended upon entirely as there are many factors to be considered.

Recent quotations giving the maximum prices for fuel oils in the *Oil & Gas Journal* are:

Chicago District	$ .80	maximum	per	bbl.
Kansas District	.95	"	"	"
Oklahoma District	.75	"	"	"
North Texas District.......	.80	"	"	"
North Louisiana District....	.85	"	"	"
Arkansas District	.03⅛	"	"	gal.
Gulf Coast District.........	.04½	"	"	"
Pennsylvania District	.05	"	"	"

There is not a great difference in heat values of fuel oils, the average value being 18,500 B.t.u.

Advantages of Oil Burning

Municipal officials and engineers are naturally interested in the relative advantages and disadvantages in using fuel oil under boilers. All sides should be carefully considered before making any drastic and expensive alterations in one's plant. The following list includes most of the advantages of oil burning:

1. Oil burning makes it possible to put boilers into operation more quickly than with coal.

2. Heat can be instantly shut off in case of tube rupture or other accident.

3. There is no banking of fires.

4. Boiler settings are more easily maintained because there is no vibration due to stokers, conveyors, doors, coal, shovels, slice bars, shaking grates, etc.

5. Furnace linings suffer no damage due to firing-tools, grate-bars, or clinkers.

6. Because of the uniform heat obtained from oil firing there is no damaging effect on crown-sheets and tubes as is the case when coal is used for fuel.

7. Better combustion is obtainable.

8. It is easier to control the air with oil firing by means of automatic damper regulation, resulting in more perfect combustion.

9. Oil fires never have to be "pulled."

10. No pulverizing is necessary, hence the cost of that labor and machinery is saved.

11. Oil does not diminish in heat value during storage.

12. Oil is not screened in order to "select lumps of the same size."

13. Less power is required to operate the mechanical draft.

14. Oil requires only about one-half the space occupied by coal of the same heat value. It is 25 per cent less in weight for equal heat value and possesses 35 per cent more heating value per pound.

15. Oil does not crumble or deteriorate in storage.

16. Oil does not ignite spontaneously.

17. Since oil does not pulverize or form dust there is no danger of dust explosions.

18. Because of more complete combustion there is seldom any smoke when the plant is properly operated.

19. Less heat is lost up the stack because less

air is required for complete combustion. The cleaner heating surface of the boiler is bound to absorb more heat than with coal.

20. Less steam is consumed for soot cleaning because tubes do not need to be cleaned as often.
21. Less labor is required for soot cleaning.
22. Smaller chimneys may be used because of the smaller amount of air used. In new construction this sometimes reduces the first cost appreciably.
23. When ashes and live coals drop through the grate they are hot and the heat in them is lost. There is no such loss with fuel oil because there is no ash or live coal.
24. For variable load conditions fuel oil is ideal. It enables boilers to take care of sudden changes in loads.
25. Because of the preference for oil burning by most engineers, a higher grade engineer is often obtainable for the same money.
26. Uniform steam pressure is more easily maintained throughout the day.
27. No ashes or soot are scattered over the surrounding neighborhood.
28. Increased boiler output with fuel oil may save the cost of an additional boiler. It is claimed by one burner manufacturer that boiler output is often increased as much as 50 per cent.
29. Two men can do the firing with oil burners which with coal would probably require nine men. A few pumps operated by a small number of men do away with a larger number of stokers, coal-passers, ash-handlers, etc.
30. Oil is seldom handled by hand. It is mechanically pumped into storage tanks located in out-of-the-way places. The fuel oil storage-tank may be located farther away from boilers than would be practical in the case of coal storage.
31. Greater cleanliness is possible in and about the plant and municipality because of the absence of coal and ash dust.
32. There are no ashes to be removed, consequently the cost of removal, storage, and the cost of equipment for handling ashes, are saved.
33. Oil is more easily controlled in combustion than is coal. It can be made to respond almost instantly to a peak-load demand.
34. Maximum boiler capacity is more easily maintained with oil. This permits extra steam to be used, if necessary, during long cold spells.
35. Oil-firing apparatus is maintained at less expense than coal-fired apparatus. There is practically no wear and tear on oil-firing equipment.
36. Higher boiler efficiency is possible with fuel oil.
37. With more time at his disposal, the engineer can give better attention to other details, thereby further increasing the general efficiency and safety of the plant.
38. No opening of furnace doors is necessary for firing or cleaning, consequently there is no sudden inrush of cold air and no temporary heat loss due to excess air.
39. Boilers are longer lived because of the elimination of strains caused by suddenly opened fire doors and the inrush of cold air.
40. The "human factor" is less prominent with oil burning after adjustments are once made.
41. Oil burners may be installed in almost any position—horizontal, vertical or oblique.

The Disadvantages of Oil Burning

The preceding list possesses, of course, only the favorable side of oil burning. The following list of disadvantages has been prepared and, although less impressive as to length, should be given equally careful study:

1. There are many unreasonable laws in some cities governing the storage of oil. This often makes its storage more expensive than the storage of coal.
2. Oil cannot be "dumped upon the ground" as can coal. Oil will "leak," whereas coal will not. The first cost of oil storage-tanks is therefore generally greater than the first cost of coal bins.
3. Tank wagons and cars are necessary for hauling oil while coal can be hauled in almost any vehicle.
4. Long-time oil contracts are not so readily obtainable as are long-time coal contracts.
5. Heaters are not necessary for feeding coal.
6. Less power is required for feeding coal.
7. Coal does not evaporate.
8. Coal combustion is less noisy than steam-jet oil combustion.

Types of Burners

When considering the changing over to oil burning and selecting a burner, it will pay to consider all details carefully. There are vast differences in burners. A type that will give excellent service in one furnace will not do well in another unless the conditions are right. Burners are to be had to take care of different grades of oil, such as Mexican crude, tar or fuel oils.

There are two broad classes of burners, (1) steam- or air-jet and (2) mechanical atomizers.

If the burner creates a long, high-velocity spray, the furnace must be long enough so that all oil will be completely burned before reaching the end of the furnace. If the burner creates a wide spray, the furnace must be wide. If the spray is conical, lateral dimensions must be sufficient to accommodate it.

With these points in view it is evident that one cannot always make the furnace fit the flame, particularly in old installations that were once coal-fired. Consequently, in such cases burners that will fit the furnace must be selected.

Some prospective users of oil burners are under the erroneous impression that only a "burner" is necessary—that it is hooked up with a steam pipe and that practically nothing else is required. However, in addition to the atomizer one must install an oil storage-tank of ample capacity, oil strainers, fuel oil pumps and governors, heaters, piping and fittings for both oil and steam, pressure gages, thermometers, steam traps, control valves, relief valves and reducing valves. Pumps and strainers are generally installed in duplicate to insure continuous operation.

The steam-jet burner breaks up the oil into a fine vapor by the direct action of steam. Usually a thin, long, fan-shaped spray is produced and is forced to pass over the brick floor of the furnace while burning. The thinner the spray, the better. The brick in the floor, called "checkerwork," is laid with openings between so that sufficient air can enter to support combustion.

Among the advantages claimed for the steam-jet type as compared with the mechanical spray are:

1. The spray is produced more easily than with the mechanical type.
2. Oil pressure and temperature may both be lower.
3. The steam-jet type is simpler and less expensive.
4. It is more flexible.
5. The steam-jet burner creates a better draft than the mechanical type and requires less mechanical draft assistance.

On the other hand, there are some important objections to steam-jet burners that should be known before selecting that type:

1. Steam used cannot be recovered.
2. The volume of steam is necessarily added to the volume of the air. Provision must sometimes be made to take care of this additional volume.
3. Steam will condense on cool surfaces and cause the adherence of soot. The soot may then cake in hard layers on economizer surfaces and inside of the stack and may be removed only with great difficulty.
4. Sulphur compounds being commonly present in fuel oil may unite with the steam and form sulphuric or sulphurous acids, which attack and corrode the boiler, steel stack, or other metallic surfaces. Sometimes oil contains as much as 4 per cent sulphur.
5. The action of the steam upon the furnace walls sometimes causes spalling.
6. The steam-jet type is more noisy than the mechanical type.

Steam-jet burners are now used under all kinds and capacities of municipal power-plant boilers—water tube, horizontal return tubular, Scotch marine, and vertical types. Pressures used for forcing the oil through the burners vary all the way from 5 to 110 pounds per square inch, while the atomizing pressures, whether with steam or air, vary from 2 to 110 pounds per square inch. The oil pressure should never exceed the atomizing pressure. The atomizing pressure should be about 5 pounds greater than the oil pressure.

Superheated steam gives better results for atomizing than saturated steam.

The evaporation of 6 pounds of water per square foot of heating surface is considered safe practice with steam atomizers.

One manufacturer of oil burners states that with the use of some burners the consumption of steam runs as high as 7 per cent. A burner should not use more than one per cent of the steam generated. These figures are at variance with other authorities who place the minimum at 1.3 per cent and the maximum at 10 per cent.

If desired, air may be used in place of steam as the atomizing agent, and it would seem on first thought that air should give better results because where steam is used air also is required for combustion. It has been found, however, in actual practice, that atomization with steam gives better results than air. To furnish air for atomizing requires the use of an air-compressor which usually costs more than the first cost of the burners.

Where water is scarce, or where it is preferable to save as much steam as possible, the mechanical type of oil burner is used, or air is used instead of steam.

Mechanical Type Burners

Most mechanical burners are similar in principle, in that the oil is given a whirling motion at the burner tip so that the oil spray enters the furnace in the form of a hollow cone. Centrifugal force is depended upon to spray the oil, which mixes with the air after leaving the burner tip.

Theoretically the mechanical burner should be more efficient than either the steam-jet or air-jet burner. In practice, however, the average mechanical burner gives more trouble. Besides, some of them use as much steam for their operation as do those of the steam type.

The conical spray has an important advantage over the flat steam-jet spray in that its area is greater. Consequently the furnace need not be as long. Further, the air supply passes through a register surrounding the burner and can be regulated more accurately than air flowing through brick checkerwork.

Mechanical burners are sometimes arranged in tiers, which is less practical with the steam-jet type. The mechanical burner causes less furnace loss because of the absence of steam that is always lost up the stack with the steam-jet type. Mechanical burners are quiet in operation as there is no "blowing" and they give higher efficiencies at high boiler capacities.

The mechanical system is often called the "high-pressure system." This is not a good name because, according to one prominent manufacturer, "75 per cent of the mechanical oil-burning systems installed by this company are operating on oil pressures of less than 100 pounds per square inch." In general the pressure ranges all the way from 30 to 200 pounds per square inch.

The disadvantage of this burner is that if the stack is not high it generally requires forced draft, unless the load is low. A combination of natural and forced draft is often used with the mechanical burner.

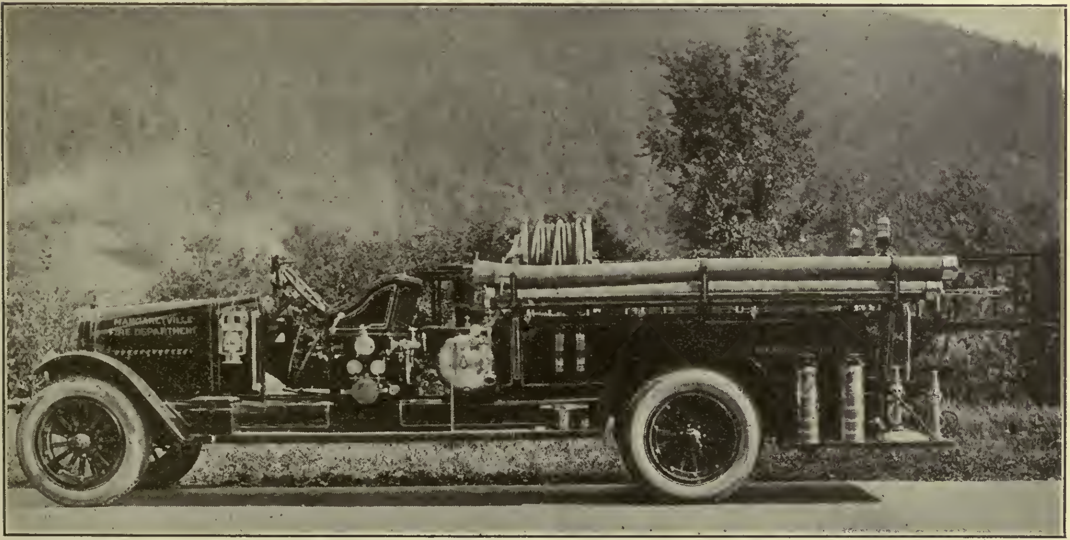
Oil Preheated

Good engineering practice with mechanical burners requires the combustion of 2 pounds of oil per hour per cubic foot of furnace volume. Oil must be preheated before it can be successfully fed into the furnace by either type of burner. It is generally heated in proportion to its gravity. The heavier the oil, the higher the temperature required. Oil up to 20 degrees Baume should be heated to 15 or 20 degrees below flash-point to insure free flowing. Oils over 20 degrees Baume need be heated only sufficiently to ensure their flow.

Unless the oil is hot enough the burner will smoke, giving incomplete combustion. If, on the other hand, the oil is heated too hot, the burner will lose in heating capacity because of the increased volume of the hotter oil passing through the burner. When the weight of oil passing through the burner per minute is reduced, it is obvious that less heat will be produced in the furnace. Oil should never be heated above its flash-point before it reaches the burner. Preheating causes carbonization and clogging of the piping system and burners.

The following instructions from the United States Navy Instructions on the operation of fuel oil burners will be of considerable value to the practical engineer.

"In operating oil fuel a study of the appearance of the furnace is a good guide to furnace efficiency. If the flame is an incandescent white and the furnace walls are clearly discernible through it, there is considerable excess air present. As the percentage of excess air is reduced, the color of the flame at the rear of the furnace becomes a pale yellow, then yellowish orange, and orange red. In general, with a well-designed installation in good condition, operating with the minimum of excess air, the end of the flame farthest from the atomizers is a yellowish orange or golden shade. The gases of combustion are colorless and the seams in the brickwork are just discernible."



THE NEW TRIPLE-COMBINATION OF ENGINE COMPANY NO. 1, MARGARETVILLE, N. Y.

We are informed by R. W. Marks, Fire Chief, Margaretville, N. Y., to whom we are indebted for this photograph, that this piece of equipment is not complicated and is easy to handle, has a quick "get-away" and ample speed and power for all requirements. The chassis is a Larrabee-Deyo with a 160-inch wheel-base. The Childs triple-combination equipment includes a 40-gallon copper chemical tank with 200 feet of chemical hose mounted on a reel, two acid and two soda receptacles mounted on a running-board, one 500-gallon Northern pump with four lengths of suction hose, two Utica short cut-off play pipes, 1200 feet of standard fire-hose, one 12-foot roof ladder, one 24-foot and one 36-foot extension ladder and four Siamese connections. In addition, the truck carries the usual equipment of axes, torches, search-lights, door-openers, etc. The pump is guaranteed to handle 500 gallons of water per minute from a draft not exceeding 24 feet vertical lift. It passed a 12-hour endurance test under the direction of the National Board of Fire Underwriters and discharged in a 6-hour test an average of 562 gallons per minute at a pressure of 129 pounds through two 50-foot lines to 1-inch and $\frac{7}{8}$-inch nozzles.

Chamber of Commerce Activities in Public Affairs

Trolley and Bus in Saginaw

SAGINAW, MICH.—The article by Walter Jackson on "Trolley or Bus in the Small City?" in the September number of THE AMERICAN CITY, indicates a wide-spread interest in a problem which we believe has been successfully solved in Saginaw.

On August 11, 1921, the Saginaw-Bay City Railway Company ceased operation following the refusal of Saginaw's electors to grant a new franchise which included the ride-at-cost plan. Jitneys and busses of sundry types attempted to give local service, while the Commission endeavored to find a responsible organization to inaugurate a dependable bus system.

On January 19, 1922, reports were presented at a membership meeting of the Board of Commerce by two committees that had been studying the problem, one as to the efficiency of the motor coach, and the other as to a comprehensive transportation plan that would prove attractive to an operating company. Both of these committees recommended the reestablishment of street cars in the congested districts, with bus lines as feeders covering three routes through portions of the city not served by the street cars.

At this meeting a resolution was approved requesting the Board of Directors to submit these reports to the membership with a referendum covering (1) the committees' recommendation, (2) a system of busses exclusively, and (3) a municipal ownership proposition then advocated by one of the city commissioners. The result of this referendum was 510 votes for the committee proposal, 197 for busses, 1 for municipal ownership, and 1 against everything.

Upon this report the Board of Directors fixed the policy of the Board of Commerce and appointed a committee to draft a franchise after a conference with the bondholders and the receiver. When this franchise was submitted to the electors, it received the necessary 60 per cent majority, but through the carelessness of an election inspector using a rubber stamp in initialing ballots, more than 500 favorable ballots were declared void by the Court, and the franchise lost by 72 votes.

On January 10, 1923, the Directors of the Board of Commerce invited the heads of eighteen other local organizations to a conference to discuss the situation and re-submit the franchise. At this conference the Transportation Committee of the Board was authorized to confer with the trustee in bankruptcy to secure agreement on certain changes in the proposed franchise to meet objections made during the previous campaign. These changes having been accepted, the Board of Directors took steps on January 23 to have the revised franchise submitted to a vote on April 2.

On this same day the Council voted to submit a ten-year motor-bus franchise to the electors on March 7. This franchise was opposed by the Board of Commerce and it was overwhelmingly defeated, the vote being 6,083 for, to 8,540 against.

On April 2 the car-bus franchise received a majority of 3,197 votes, but lacked 142 votes of getting the required three-fifths vote. However, at this election the Mayor and two commissioners who had been unfavorable to the reestablishment

TYPE OF BUS USED AS FEEDERS FOR THE STREET-CAR SERVICE IN SAGINAW of cars were defeated and a commission favorable thereto elected. Under the leadership of the new commission, the franchise was again submitted, on June 25, and approved by the overwhelming vote of 9,112 to 3,061.

Formal organization of the new company was immediately started, nine directors being chosen, six to represent the public and three the security holders. All the directors serve for fifteen years. The six representing the public are approved by the Mayor and the Circuit Judges of Saginaw County.

The new company began operations on its fifteen-year franchise on November 1, 1923. The fare is fixed for the term of the franchise at ten cents cash, four tickets for twenty-five cents, and free transfers interchangeable between all cars and busses.

Public sentiment is enthusiastic for the efficiency of Saginaw's present transportation system.

CHARLES W. HAENSEL,
Secretary, Saginaw Board of Commerce.

FIRST INDIAN SECTION OF THE PARADE IN THE PEKIN, ILL., CENTENNIAL CELEBRATION

Giving an idea of the size of the crowds that lined both sides of the streets for a mile and a half

A Three-Day Centennial Celebration

PEKIN, ILL.—On July 2, 3 and 4 this Central Illinois city of 14,000 population celebrated the 100th anniversary of the building of the first log cabin by one Jonathan Tharp on the present site of the city.

In order to commemorate this earliest beginning of the municipality, it was decided to invite all former residents, friends, relatives and guests to a big birthday party. The plans were started about ten months before the date finally chosen for holding the celebration.

From the first inception of the Centennial, the sentiment of the business men was that, for once in the history of Pekin, a celebration with its accompanying crowds should be staged without the ulterior motive of exploitation for profit. No games of chance were allowed and no charges made for any of the entertainment. Everything was free.

The whole three-day program cost about $8,000, which money was raised entirely by popular subscription. Two plans of finance were used. One was a house-to-house canvass, by captains and workers, for the sale of Pekin Centennial Patron Buttons. Any one giving $1 or more to the general fund was considered as a Patron of the celebration, and therefore entitled to wear the button. On this drive, practically every home in the city subscribed. The rest of the money was raised in the business district and from the industries. The subscriptions from these latter were based on the length of time they or their firm had been established in the city.

In planning for the Centennial, invitations were first sent to all organizations in the city, asking

A REPLICA OF THE FIRST LOG CABIN IN PEKIN, ILL., USED IN THE CENTENNIAL CELEBRATION

The cabin is made of ash logs, and its estimated weight is 20,000 pounds. It has been placed on a permanent foundation in a city park

each to appoint a Centennial Committee of three. These committees were then called together to a general mass meeting, at which time the organization was built up that eventually carried the plans through to successful completion. An executive committee was created, made up of one representative from every interested organization in the city, and every phase of the program was covered by an active special committee. Probably the biggest factor contributing to the success of this civic event was this committee service. Two hundred and thirty people were involved in some way in preparing for and administering the affairs of this undertaking.

The forms of publicity used were newspaper advertising, poster service throughout the county, engraved invitations sent to a special mailing list of influential men and women, and an embossed seal, or sticker. The engraved invitations were sent to the leaders of government at Washington and at the State Capitol, as well as to the mayors, public officials, and newspaper men of nearby cities. The embossed seals, 25,000 of them, stimulated letter writing. They were distributed free of charge to any one for the asking, the only requirement being that they be used only on outgoing mail.

One of the "high lights" of the Centennial was the Old Relics Exhibit, for which every show window of any consequence in the city was used. All articles of historical interest and of any antiquity, obtainable in the community, were on display. In order to make this more interesting, certain windows had related objects, such as complete bedroom furnishings, dining-room sets, kitchen equipment, books, linens, arms—both Indian and pioneer—pictures, newspapers, etc. This exhibit proved to be so interesting that people continued to come from neighboring cities to see it days after the period of celebration had passed.

Each day, a program of stunts and contests of various kinds was held, the winners receiving valuable prizes of Pekin-made products.

The first day was Home-Coming Day, the program including contests, band concerts, a county picnic and a ball game. An official register was opened in the Court House for the registration of all visitors and former residents. During the three days some 2,000 visitors registered.

On the first evening, a play entitled "One Thousand Years Ago" was staged in the natural amphitheater in the City Park. The setting of this play was in Peking, China. One hundred people took part. The performance was seen by over 8,000 people.

On the second day, in addition to the program of stunts and races and the exhibition of antiques, a free barbecue was featured. It was estimated that 7,600 people were fed. A feature of the afternoon program was the Indian dances and pantomime, put on at the Indian village established in the park. In the evening a costume and mask dance was held, which proved to be very popular. Cash prizes were given for the most unique costumes, special emphasis being given to those showing styles prevailing 100 years ago.

The last day of the celebration, the Fourth of July, was notable for the great number of people who came to see the historical pageant parade, to hear noteworthy speakers, and to see the ball game and the big display of fireworks in the evening. The first section of the parade was historical and contained 26 floats. The second section was fraternal. In all, it stretched over 2 miles.

The estimated number of visitors in the city on the Fourth of July was 60,000. An accurate check on cars coming into the city over the main traveled highways showed that there were in excess of 11,000 cars in town.

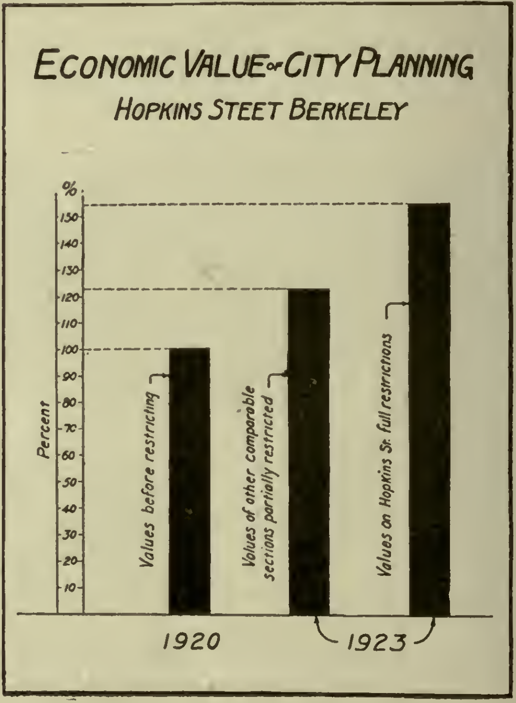
Taking it all together, and considering it as a civic enterprise, Pekin's Centennial was a pronounced success. More people joined forces to make it a success than have ever before been joined together in any civic enterprise in this city. It promoted civic pride and a willingness to serve.

L. D'OOGE,
Secretary-Manager, Association of Commerce.

Land Values Increased by Restrictions

BERKELEY, CALIF.—At a Fair recently held by the Chamber of Commerce, the municipal booth contained many interesting graphic charts that described many functions of the city government. Among these were two charts that showed the economic value of parks and residence building restrictions. The former showed that the value of the property in the vicinity of Central Park, New York, in 1858, had increased 800 per cent in fifteen years owing to the opening of Central Park. Similar comparable property values somewhat remote from the Park increased but 100 per cent.

The other chart showed the effect of building restrictions in Berkeley as evidenced by the increased assessed valuation of the property along and near Hopkins Street between the Southern Pacific tunnel at the end of Del Norte and the Alameda. These relative values are shown in the graph below. The height of the columns in the graph were computed in percentages by taking the values of property along Hopkins Street and also near Hopkins Street and in the vicinity of Carlotta and Posen Streets. These values are taken at 100 per cent in 1920. In three years the fully re-

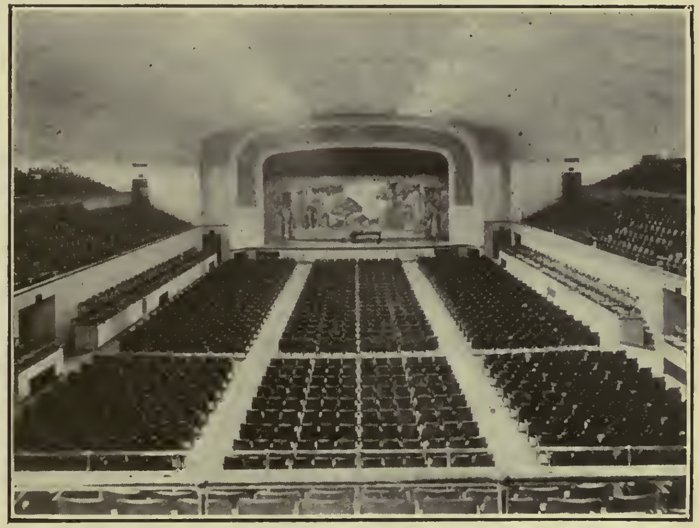


stricted residence property along Hopkins Street between Del Norte and The Alameda increased in value about 54 per cent, while the less restricted property west of The Alameda increased about 23 per cent.

The City Planning Commission is using such facts as these to prove to the people of Berkeley that, in residence districts generally, the growth of assessable valuation is retarded if uncertainty exists regarding the determination and stability of restrictions. The predominance of the residence character of Berkeley makes it imperative, for economic considerations, to strive to increase its property values by suitable zoning, stability of restrictions, enhancement of beauty of structure, setting and arrangement, by up-keep of streets, parked areas, and wise provision for growth.

WESLEY C. MILLER, JR.,
Secretary, City Planning Commission.

MUNICIPAL AUDITORIUM, COLORADO SPRINGS



INTERIOR OF THE COLORADO SPRINGS AUDITORIUM

Municipal Auditorium Serves Local Needs and Attracts National Conventions

Colorado Springs, Colo.—Since the formal opening of the Municipal Auditorium in June, 1923, the building has been in big demand. Famous opera singers, pageants, fairs, basket-ball games, state and national conventions of political and fraternal orders, boxing contests, great religious gatherings, balls, agricultural exhibits and band concerts have been held in the structure. The building includes three so-called little theaters, which are constantly in demand for various affairs. In the basement the Police Department of Colorado Springs has a large rifle and pistol range.

The building was financed by a bond issue voted by the taxpayers of Colorado Springs in June, 1921, the electors authorizing an issue of $390,000. This did not include the furnishing of the structure, which brought the total cost up to $424,000. Maintenance is comparatively inexpensive, the City Manager's report for 1923 showing the total cost to be $4,885, from which must be deducted the rentals.

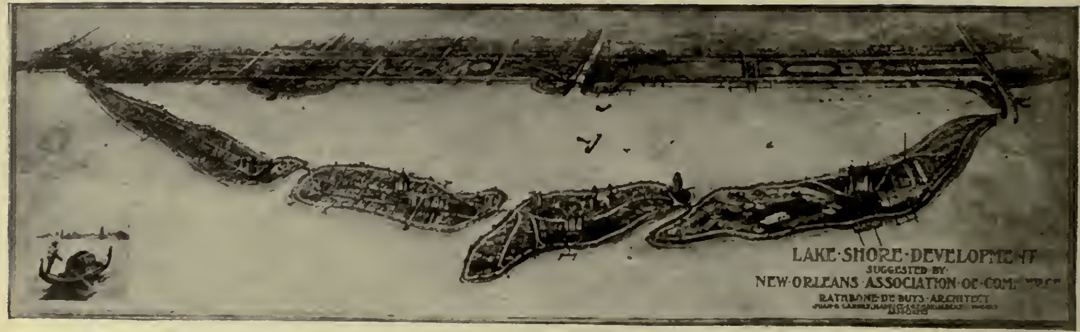
The Chamber of Commerce of Colorado Springs —with an active membership of 1,073—indorsed the project and aided in putting the bond issue over. Completion of the building, which seats slightly more than 3,000 persons, makes it possible to invite national conventions to the Pike's Peak region—a physical impossibility hitherto.

ELIZABETH L. BELSCHNER,
Secretary, Convention Bureau, Colorado Springs Chamber of Commerce.

To Create a Chain of Four Islands

New Orleans, La.—Following the authorization by the Louisiana Legislature of the issuance of bonds for the development and beautification of the New Orleans shore-line of Lake Pontchartrain, and the creation thereby of an all-year water-side resort, the New Orleans Association of Commerce has submitted plans for such a project to the Levee Board.

Lake Pontchartrain, which is an arm of the Gulf of Mexico forty miles in length and twenty miles in width, is for the most part shallow, its depth in some places being only ten feet. The Association has therefore suggested that the Levee Board take advantage of this feature by the creation of a chain of four islands, as illustrated on the drawing reproduced on page 380. These islands, which would contain more than 1,000 acres of land, would afford excellent locations for resort hotels, tea gardens, recreation parks, bathing-beaches, etc. In addition, they would provide a much-needed protected harbor three-quarters of a mile wide and five miles in length. While no estimate of cost and probable revenues was submitted with the plans, the Association has satisfied itself, through consultation with archi-


LAKE·SHORE·DEVELOPMENT
SUGGESTED BY
NEW·ORLEANS·ASSOCIATION·OF·COMMERCE
RATHBONE·DE BUYS·ARCHITECT

tects, engineers and dredging contractors, that the cost of building up the proposed islands would not exceed the value of the land so provided. It has been estimated that the creation of the land would cost about $7,000 an acre, and by making one-half of this land available for sale at its probable value of about $40,000 an acre, sufficient funds would be received to cover the entire cost of the project, including the embellishment of the parks, construction of driveways, etc.

The Association's plans also include the extension of the present shore-line and the reclamation of several thousand acres of land for public parks, playgrounds, boulevards and residential sites, and the construction of a land and hydroplane base, the need for which has been impressed upon the city of New Orleans many times in recent years. The cost of these developments also, it is believed, will be more than covered by the revenue from the sale of surplus improved water-front sites.

WALTER PARKER,
General Manager, New Orleans Association of Commerce.

Organizing a County for Municipal and Regional Planning

IN the formation of the Passaic County Planning Association, with headquarters for the present in the Chamber of Commerce, Paterson, N. J., a unique method has been adopted for the organizing of residents of a county in a group whose purpose is the advancement of the city and county planning movement.

Bertram H. Saunders was the prime mover of the organization. He is the Chairman of the North Jersey Rapid Transit Commission, empowered by the New Jersey Legislature to deal with passenger facilities in the metropolitan district of New Jersey adjoining New York City, and also a member of the City Plan Commission and the Zoning Board of Adjustment of Paterson.

The organization of the Passaic County Planning Association has followed a carefully outlined course designed to insure its permanency. Early this year there was called together a group of prominent and influential men of Paterson and Passaic County at a dinner round-table in the Hamilton Club, Paterson, at which the sentiment that was sounded was in favor of the formation of such an association. This was followed by a public mass meeting in the High School auditorium, Paterson, at which Lawson Purdy, of the Plan of New York and Its Environs, and Thomas Adams, general director of plans and surveys of that committee, were speakers. At this time the approval of 500 citizens was given to the formation of the association and a committee was appointed to carry out the organization.

A series of organization meetings followed; the Passaic County Planning Association was incorporated under the laws of the state; temporary officers were named, then a constitution and by-laws drawn, and later permanent officers elected. At one of these organization meetings, an illustrated talk was given by Major Gilmore D. Clark, landscape architect of the Westchester County Park Commission, showing the development of the Bronx River from what was actually an open sewer to a beautiful parkway, thirteen miles long and running from New York City to the Kensico dam, on which the sum of $15,000,000 has been expended.

The Passaic County Planning Association takes on what is believed to be its unique form in that its membership is to include as many groups as there are municipalities in the county. Permanent organization was effected in June, so that with the ensuing summer vacation period the building up of a large membership was deferred until after Labor Day, but officers have been elected and group chairmen appointed as follows:

President, Richard Morrell, Passaic; First Vice-President, John C. Barbour, Clifton; Second Vice-President, Frederick S. Ranzenhofer, Passaic; Third Vice-President, Bertram H. Saunders, Paterson; Secretary, Filbert L. Rosenstein, Paterson; Treasurer, William R. Meakle, Paterson; Paterson group chairman, Mr. Saunders; Passaic group chairman, Mr. Ranzenhofer; Clifton group chairman, Mr. Barbour; and Hawthorne group chairman, William Mearns. There are three cities and thirteen boroughs and townships in Passaic County.

The object of the Passaic County Planning Association, as stated in the by-laws, is "to disseminate information relative to municipal and regional planning and to promote interest in the orderly development of our region." As much of the work will be in the nature of educational propaganda, the Association has named an active newspaper man, Charles A. Winans, as its executive secretary on a part-time basis. Membership is open to any adult resident of Passaic County upon payment of $1 a year dues in advance.

A Study of the Source and Expenditure of County Highway Funds

Results of an Analysis of the Finances of Four Wisconsin Counties, by the Committee on Highway Finance of the Advisory Board on Highway Research of the National Research Council

DR. J. G. McKAY, of the United States Bureau of Public Roads and Chairman of the Committee on Highway Finance, in the report of that Committee at the third annual meeting of the National Research Council, Division of Engineering, stated that before any decision could be made as to the justice or expediency of present methods of highway financing, it was necessary to make a complete study of the sources of highway revenue, local, county and state, in typical states. Most of the previous investigations have been limited to a study of the sources of state revenue for highway purposes and have disregarded the county and local expenditures for highway construction and maintenance. The following results are based on an analysis of all sources of revenue and expenditures in four Wisconsin counties from 1915 to 1921. Wisconsin was selected as a state whose system of highway financing represents a fair average of methods of raising highway revenues in other states. The four counties—Dane, Outagamie, Rusk and Waukesha—were chosen for the purpose of determining the percentage of revenue for highway purposes which is provided by each of the several sources of revenue. These counties were selected as typical counties, representing the highway development in different sections of the state.

Dane County is a well-populated, rich agricultural county, with no highway bond issues. Madison, the capital city of the state, is located in the center of this county. Outagamie County is a good agricultural county. It has financed a large portion of the construction of its highway system through bond issues since 1916. Rusk County is located in the newer section of the state. It is a purely agricultural county, with soil of average fertility, but as yet largely undeveloped. No highway bond issues have been made and its highways are, with the exception of the state trunk highways, largely unimproved. Waukesha County lies west of the city of Milwaukee and is a rich dairying and manufacturing county. It has floated large bond issues during the last three years.

To determine the total expenditures for highways in each of the counties in which the analysis was made, it was necessary to consolidate the expenditures made by the local units within the county, the expenditures made by the county, and the expenditures of state and federal funds within the county. The expenditures by the different governmental units have been carefully analyzed and all expenditures appearing in the records of more than one unit have been eliminated in all except the unit which actually raised the funds for highway construction or maintenance. In the local units the expenditures made by cities have been eliminated, as their expenditures are almost exclusively for streets rather than for highways.

An analysis of the total expenditures for highways within each county shows that the proportion of the burden of all highway expenditures which rests upon real property varies from 55 per cent to 70 per cent in the four counties. The highest proportion is found in Rusk County, a relatively undeveloped county, while the lowest proportion is found in Waukesha County, a very rich section, both agriculturally and industrially. This variation is due largely to differences in revenue derived from the income tax. In the richer counties the income tax furnishes a larger portion of the total revenue, and, as a result, in so far as funds for highway expenditures are taken from general revenues, the income tax furnishes a larger proportion of revenue for highway expenditures. It must be noticed that real property taxation and "other revenue" taken together furnish almost the same proportion of revenue for highway expenditures in all counties, the figures being: Dane County, 76.82 per cent; Outagamie County, 79.86 per cent; Rusk County, 81.35 per cent; and Waukesha County, 78.68 per cent.

A comparison of the proportions furnished by each source of revenue in any one county for the different years substantiates the conclusion that the contribution of real property varies inversely as the contribution of "other revenue." "Other revenue," as the name in-

The Nation's Road Maker

HOLT TRACK PIN

The Holt track pin illustrates the rigid requirements of Holt quality; and it is an important factor in "Caterpillar" strength and endurance. Cold drawn 3½ per cent nickel steel, used in 5-Ton and 10-Ton track pins, has an initial tensile strength of 65,000 lbs., Scleroscope hardness 25 to 30. This stock is subjected to three heat treating operations. (1) Case hardening; to withstand abrasion. (2) Hardening; toughening the core; increasing hardness of case. (3) Drawing; refines metal structure. The track pin emerges from the Holt heat treatment with a tensile strength of 140,000 lbs. Scleroscope hardness of core 40 to 45, hardness of case 75 to 85; doubling initial tensile strength, tripling initial hardness.

Wherever you see "Caterpillars" at work, building or maintaining roads, or on engineering projects of all kinds, you may know that a wise investment has been made for the *right* power equipment. The "Caterpillar" is a real servant; it has rugged endurance; ample power.

With its sturdiness and positive traction, the "Caterpillar" stands the hardest usage; pulling heavy graders, scarifiers, scrapers, maintainers, and every other type of road tool, in the toughest soils; hauling great tonnages of materials and supplies; moving dirt on all kinds of engineering projects; breaking snow blockades on northern city streets and country highways. It is built to work—and built to last.

No other machine has such varied usefulness. Most of your tractive jobs can be done better, quicker and cheaper with the "Caterpillar" than by any other method. Cities large and small, counties, townships, road districts, park boards, contractors, prefer "Caterpillars" because no other power is so economical; no other is so versatile in getting work done at the least cost and in the shortest time.

Our new booklet will interest you. Copy will be sent upon request.

"THE NATION'S ROAD MAKER"

There is but one "Caterpillar"—Holt builds it.

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dicates, is made up of all sources of revenue exclusive of real property, personal property, automobile license fees, special assessments and miscellaneous contributions, but the principal part of it is made up of revenue derived from the income tax. The other sources of revenue included under this head, such as fees, fines, etc., form a very small proportion of the total in this class. The annual expenditures by counties from each source of revenue show that in the years 1917 to 1918, when the receipts from the income tax were highest, the proportions of revenue derived from real property taxation were smaller than in the years when the receipts from the income tax were smaller:

Percentage of Total Revenues for Highway Expenditures Raised by Various Governmental Units

County	Local Funds	County Funds	State Funds	Federal Funds
Dane	41.27	32.81	20.54	5.38
Outagamie	34.88	49.63	12.01	3.48
Rusk	48.20	30.37	15.36	6.07
Waukesha	39.56	29.55	21.76	9.13
Average	39.62	36.43	17.89	5.76

This table indicates the importance of funds raised by the local units (townships and villages) for highway purposes, as compared with state and federal funds. It will be noted that the funds raised by the local units and counties furnish from 69 per cent to 84 per cent of the total highway expenditures. While this analysis is based on only four counties, it is safe to assume that these proportions are reasonably correct for the state of Wisconsin, since the counties studied were selected as representative of the various counties within the state. In other states the proportions raised by the various governmental units may vary to a considerable extent from those shown in the table, but in those states organized on the township basis the funds raised by the local units and counties will approximate these percentages. The percentages shown are derived from total expenditures within the different counties for the period 1915 to 1921, inclusive. It should be noted that this period includes a few years before the period of federal aid, and also that the activity of the state in the highway field has increased greatly during the later years; so that had the period been made to include only the years 1918 to 1921, the percentages derived from state and federal funds would probably have been larger.

Although the proportions of highway expenditures contributed by local, county, state and federal units, as indicated above, may vary to a considerable extent in different localities, nevertheless the figures are conclusive evidence that any discussion of highway finance treating exclusively of state and federal expenditures omits local and county expenditures, which constitute the major portion of the total highway expenditures. While it would be advantageous to have more of our highways entirely financed and constructed by the state, the fact remains that at the present time local and county highway expenditures absorb the major portion of funds raised from all sources for highway improvement.

Percentage of Total Revenue for Highway Expenditures from Real Property Taxation Levied by the Various Governmental Units

County	Local Taxation	County Taxation	State Taxation	Federal Government	Total
Dane	30.56	21.98	7.75	....	60.29
Outagamie ...	23.32	35.64	4.41	....	63.27
Rusk	39.54	24.81	5.48	....	69.83
Waukesha	25.39	21.54	8.36	....	55.29
Average	28.42	25.94	6.71	....	61.07

While the general property tax is the most important single source of revenue for highway expenditures in all units—the township, the county and the state—its importance as a source of highway revenue is much greater in the township and county than in the state. As will be noted in the table giving the percentage of total revenue for highway expenditures from real property taxation levied by the various governmental units, real property taxation by the local units furnishes from 23 per cent to 39 per cent of all highway expenditures, and county real property taxation provides from 21 per cent to 35 per cent of the total highway expenditures, while state real property taxation provides only from 4 to 8 per cent of the total highway expenditures.

Percentage of Real Property Revenue for Highway Expenditures Levied by the Various Governmental Units

County	Local	County	State
Dane	50.70	36.45	12.85
Outagamie	36.70	56.33	6.97
Rusk	56.62	35.52	7.86
Waukesha	45.93	38.95	15.12
Average	46.54	42.47	10.99

The table showing the proportion of real property taxation revenues for highway expenditures levied by the various governmental units shows an average of 46.54 per cent revenue raised by local units, 42.47 per cent by county units, and 10.99 per cent by the state. The real property revenue for highway expenditures raised by the state in comparison with local and county real property revenues is but a small share of the total real property revenue raised for highway improvement.

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The 4-cylinder 2 to 3 ton Autocars in this fleet are equipped with a special all-steel water-tight sanitary body mounted on the Autocar rotary dumping mechanism. Each body is completely covered so that refuse carried in it will not be exposed to the air.

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Sources of Highway Revenue for Total Highway Expenditures

Source	Average Percentage
Real property taxation	62.17
Other revenue (largely income tax funds)	17.01
Personal property taxation	11.29
Vehicle license fees	8.84
Miscellaneous	.69

It is to be noted that real property taxation produces seven times as much of the total highway revenue as that derived from motor vehicle license fees, while the taxation of incomes, that is, other revenue, produces approximately double the amount raised by vehicle license fees. Since local funds are expended on purely local roads, it is fair to compare the amount of county and state real property tax funds produced for expenditures on state and county highways with the amount raised by vehicle license fees used on the same highways. County and state real property taxation produce 32.65 per cent of total highway revenue, license fees produced 8.84 per cent. Real property, which contributes 61 per cent of all highway expenditures, produces for county and state highways four times as much of the total expenditures as that produced from vehicle license fees.

Conclusion

The following conclusions are based on the analysis of the sources and expenditure of highway funds in the four representative Wisconsin counties chosen for this study:

1. The major portion of the total of highway funds in Wisconsin during the 7-year period from 1915-1921 was raised by township and county units rather than by the state.
2. Real property taxation was the chief source of highway revenue, producing an average of 61.07 per cent of the total local, county and state highway expenditures.
3. Vehicle license fees produce 8.84 per cent of the total highway expenditures.
4. Real property taxation for highway purposes bears too large a portion of the burden of highway expenditures, producing from 55 per cent to 70 per cent of the total highway revenue.
5. The major portion of the burden on real property is due to local and county taxation of real property for highway purposes. The local units produce 46.54 per cent; county units, 42.47 per cent; and the state, 10.99 per cent of the real property revenue for highway expenditures.
6. Real property contributes a larger share of highway revenue during periods of depression, when the revenue from other sources decreases. This results in an excessive levy on real property owners, since the tax levy on real property is paid from income derived from the property, and in periods of low prices this income is reduced at least as much as income from other sources.
7. When income tax funds increase within a county, real property taxation for highway purposes decreases.
8. As a county develops and grows richer, the relative burden on real property for highway purposes decreases. When a county or state is in the developmental stage, the cost of the permanent features of highway improvements can be economically financed by issuing a limited number of deferred serial highway bonds. By this method the burden on property is lightened during the early years of the improvement, increasing with the ability of property to produce more revenue as a result of the highway improvements.
9. A reduction of elimination of state taxation of real property for highway purposes in Wisconsin would not materially reduce the total of real property taxation for all highway purposes.
10. Reduction of real property taxation for highway purposes in Wisconsin would result largely in a reduction of local and county taxation of real property for township and county highway expenditures.

How Can Real Property Taxation for Highway Improvements Be Reduced?

The two logical sources of highway revenue are real property taxation and vehicle license and gasoline taxation. When real property taxation produces too large a share of highway revenue in comparison with the share produced by vehicle license and gasoline taxation, there are three courses which may be followed:

1. The elimination of inefficiency and waste in the expenditure of highway funds by the local and county units. Of all real prop-

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erty tax funds for highway expenditures 89.03 per cent is raised by the local and county units. Any reduction in expenditures by eliminating the waste of highway funds will result in a reduction of the burden on real property for highway expenditures. This may be accomplished as follows: (1) provide for strict supervision by the state highway department over the construction and maintenance of purely county highways; (2) provide for close supervision by the county units over township highway expenditures, possibly limiting the maximum expenditures by the local units for highway expenditures to a fixed percentage of the township property valuation.

2. A reduction in the total yearly highway expenditures—township, county and state.

It is obvious that the present county and state expenditure for highway improvements lags behind the need for improved highways and is not a desirable solution of the problem.

3. Shift part of the burden of highway improvements from real property to other sources of revenue.

By substituting other sources of revenue for a portion of the real property revenue, we cannot decrease the total revenue raised by the various units necessary for purposes other than highway improvement. A reduction in the amount of highway improvement revenue raised from the taxation of real property without raising a like amount from some other source of revenue would result in a reduction of the total highway funds below a necessary minimum. The logical solution is to increase the total revenue raised from old or to create new sources of revenue for highway improvement to replace the revenue lost by the lowered taxation of real property. The source of this increased revenue is the highway user, where demand for highway service is largely responsible for highway improvements.

An Argument for Regional Planning

THE following statement issued August 12, 1924, by C. B. Whitnall, Secretary, Milwaukee County Park Commission and Rural Planning Board, while referring particularly to the Milwaukee region, may be helpful to other communities which are awaking to the importance of regional planning:

"Milwaukee's future welfare depends very largely upon its foresight in the promotion of health and comfort for all who are dependent upon the activities contributing to the city's prestige. Also, on the promotion of efficiency, with economy, in the conduct of its industrial pursuits. Neither of these two most vital factors can possibly be accomplished within areas limited by chance jurisdiction of political bias.

"Inflated values, loss of time, and devitalized atmosphere make decentralization imperative. In effecting this decentralization, our industries must be provided for, for their ability to serve the outside world with greater economy and efficiency is our stability. The skill and manhood upon which our industries are dependent must also be provided for. Taxation which accomplishes these beneficial results will not be burdensome, while taxation failing in this respect, even though less in amount, becomes intolerable.

"City planning is serving its purpose, but its scope of activity is by far too circumscribed to provide for the decentralization which is so urgent. The most efficient and economical decentralization possible requires the careful allocation of lands to their most appropriate use, for which we find the whole metropolitan area of our county none too large. The problems which affect each community of the metropolitan area are regional problems. The development of common arteries, location and development of industrial areas and their balancing with residential areas, with requisite park influences and recreational facilities, are more vital to the city of Milwaukee than anything it can possibly do within its own limitations. Without prompt relief disintegration will be inevitable.

"The only salvation for Milwaukee's future is the careful development of its regional or contributing areas, by an orderly comprehensive plan. One of the most serious responsibilities of the Milwaukee Common Council is its cooperation in regional planning, the whole intent of which is to secure that unity of metropolitan consciousness, that conception of the magnitude of the task of adequate planning for the future and the willingness to work together, which will carry forward a great and fundamental program. Narrowness, selfishness, or self-sufficient tendencies are badges of inefficiency, and are never in harmony with constructive ability.

"Milwaukee's industries at present are not functioning to the best possible advantage. The whole metropolitan area is the loser, and it makes very little difference within which of the sixteen independent political boundaries within Milwaukee County an industry is located. Such inefficiency deters progress of the whole, for there exists an interdependence between all these political entities which our County Government recognizes, and will endeavor to harmonize.

"The adjustment of present discords must be broad and comprehensive enough to attract the further investment of millions now seeking locations, particularly since the termination of the Pittsburgh Plus Plan. Our invitations to capital and skilled labor must represent us as a homogeneous whole, not as discordant units."

A single snow can cost millions

A city's business losses in a single snow storm may run into millions of dollars. They did in New York. But more important, and harder to estimate, is the loss to life and property, should fire trucks be held up for an hour in getting to a single fire.

Snow is rain, expanded ten times—yet a hundred times harder to remove, and a thousand times more of a menace. Men, even if they could stand the strain of day and night work, could not shovel fast enough to prevent severe traffic tie-ups and their consequent losses.

In Chicago, comparative performances on snow loading show that a Barber-Greene Snow Loader is 48 times faster than hand labor, or that it does the work of 192 shovelers. It took 4 shovelers 10 minutes to load a 3-yard wagon, while a Barber-Greene loaded an 8-yard truck in 20 seconds.

Such tests, made each winter in cities all over the country, show that the Barber-Greene has brought about a heretofore unheard-of speed and efficiency to snow removal.

During a Springfield, Massachusetts, snow storm last winter, a Barber-Greene kept seventeen 5-ton trucks busy, and could have gone faster. Over a period of 6 hours, an average of a truck every 2 minutes was maintained.

The Barber-Greene is quickly transformed into a bucket loader, and is then ready for summer road work. Working on a St. Louis street paving job, a Barber-Greene Bucket Loader replaced 12 men and sped up the work 50%.

"Snow Insurance" will show you how cities large and small have eliminated the snow menace, and how the Barber-Greene is saving them substantial sums on summer paving work. Send for it.

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Hints, Helps and Happenings

Tenure of Office of 2,170 City Clerks

IN reply to an inquiry from THE AMERICAN CITY, 2,170 city clerks in the United States and Canada have furnished information as to the number of years which they have occupied their present positions. In the list there are 17 veterans who have seen 30 years or more of continuous service. These are:

Date of Appointment	Municipality	City Clerk
1874	Milford, N. H.	James M. Laws
1876	Cedarburg, Wis.	F. G. Schuette
1879	Winnipeg, Man.	C. J. Brown
1894	Hearne, Tex.	W. W. Bivin
1886	Pepperell, Mass.	Frank R. Bennett
1886	Monroe City, Mo.	Geo. W. Tompkins
1887	Elmira, Ont.	John H. Ruppel
1889	Canton, N. Y.	Herbert M. Barber
1889	Polo, Ill.	George H. Butts
1891	Hollidaysburg, Pa.	Robert W. Smith
1892	Victoria, B. C.	E. W. Bradley
1892	Albion, Pa.	S. A. Collins
1892	Bellevue, Pa.	J. M. Simeral
1892	Champlain, N. Y.	N. P. St. Maxens
1894	Morganfield, Ky.	A. F. Waller
1894	Cameron, W. Va.	J. S. Fish
1894	Fox Lake, Wis.	Wm. F. O'Connell

Of the rest, 67 have held their present positions for from 20 to 29 years; 188 have a record of 10 to 19 years; 303 of 5 to 9 years, and 1,595 have thus far had less than 5 years of service.

Pittsburgh Against Destructive Taxes

IN 1697 the British Government levied a tax on houses according to the number of windows. It lasted until 1851. It was then seen to be a tax which destroyed windows and shut out light from houses and injured the health of women and children especially. Windows were destroyed by taxation. The tax showed darkness in governmental minds and produced it in homes.

In Egypt once, the government, arguing that incomes came from date trees, taxed them. Thousands of date trees were cut down to avoid taxation, the government lost taxes, and the people starved for dates.

The power to tax is the power to destroy. A tax on date trees destroys the trees. A tax on windows destroys windows. A tax on incomes destroys incomes. A tax on improvements destroys the purpose to improve.

In Pittsburgh, the city is trying to avoid the destruction of desirable things by taxation. There is no state tax in Pennsylvania on real estate or personal property. Now the city has reduced its tax on improvements until they pay only 60 per cent of the rate on land values. If you owned a factory on a $10,000 site in Pittsburgh, with buildings on it worth $10,000, with machinery, raw materials and finished goods worth $50,000, your taxes would be $190 on the land value, $114 on the building, and nothing at all on the goods on hand, making a total of $304.

Next year the tax on buildings and improvements will be reduced to 50 per cent of the rate on land values. And Pittsburgh seems to like the idea.

It is a guarantee that the things produced by industry will not be destroyed by taxation, as the date trees were in Egypt and the windows in England.

The thing which this system tends to destroy is land monopoly; for the burden rests more and more heavily on sites. But this is beneficial to industry.

"Come to Pittsburgh," says this policy in taxation. "We levy taxation so as not to destroy industry, but to do away partially with monopoly of natural opportunity, the foe of industry. We try not to kill the good thing."

Taxation is destruction—of something.

An editorial by Herbert Quick, published September 6, 1924, in *Pittsburgh First*, the official weekly organ of the Pittsburgh Chamber of Commerce.

Program for American Education Week

THE American Legion, the United States Bureau of Education and the National Education Association are again cooperating in plans for American Education Week, which this year is to be observed November 17 to 23. The designations of the seven days of the week, and the descriptive phrase adopted for each, are as follows:

MONDAY—CONSTITUTION DAY.—"Our Constitution—The Bulwark of Democracy and Happiness."

TUESDAY—PATRIOTISM DAY.—"The United States Flag is the living symbol of the ideals and institutions of our Republic."

WEDNESDAY—SCHOOL AND TEACHERS' DAY.—"The Teacher—the guiding influence of future America."

THURSDAY—ILLITERACY DAY.—"Informed intelligence is the foundation of representative government."

FRIDAY—PHYSICAL EDUCATION DAY.—"Playgrounds and athletic fields mean a strong and healthy nation."

SATURDAY—COMMUNITY DAY.—"Service to Community, State and Nation is the duty of every citizen."

SUNDAY—FOR GOD AND COUNTRY DAY.—"Religion, morality and education are necessary for good government."

Real Estate Boards Undertaking Clean-up of Industrial Tracts

MANY real estate boards are enlisting actively in the campaign now being carried on by the National Association of Real Estate Boards through its Industrial Property Division to clean up the "back yard" of the city—the sections of its industrial plants which make the principal part of the town visible to the casual passer-through on the railroad right of way.

With the clean-up campaign is coupled a movement to make it possible for travelers to identify by name the towns they are passing through. Attractive planting along the right of way is part of the clean-up and paint-up movement in some of the cities.

Committees to undertake the alignment of local industries with the railroads in making the view from the right of way something more than ash heaps and rubbish piles have been appointed by real estate boards belonging to the Association in the following cities: New Orleans; Milwaukee;

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Service boxes should always be covered—for every uncovered box means an expense for cleaning out when the curb stop must be reached—and often results in damage suits for personal injury.

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are made for both new and old style Buffalo Service Boxes, and will make a perfect fit, regardless of the condition of the box top. Readily attached with the regular pentagon wrench, but cannot be removed without it—they cannot be pried or knocked off.

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Duluth; Atlanta; Erie and Lancaster, Pa.; South Bend; Dayton; Des Moines; Trenton, N. J.; Providence, R. I.; Lockport, N. Y.; Dade City, Fla.; Warren, Ohio; Mishawaka, Ind.; Kankakee, Ill.; Madison, Wis.; Little Rock, Ark.; Arkansas City, Kans.; Ogden, Utah; Casper, Wyo.; Albany, Ore.; and Pasadena, Venice and Riverside, Calif.

Other real estate boards have held special meetings to outline what form their participation in the campaign should take.

The American Railway Development Association has passed a resolution pledging its cooperation in the realtor movement for spruce and businesslike appearances in industrial areas. Individual railroads are cooperating through their development departments. Newspapers of the various cities are helping in enlisting the public in the putting of the city's best foot foremost.

New York City Health Department Releases Health Center Film

A MOTION picture entitled "It Works" has been released by the Department of Health of the City of New York. The film shows how twenty-two agencies, headed by the Department of Health, and acting at the suggestion of the American Red Cross, have successfully organized and operated a health center in East Harlem, New York City. The film is being distributed free of charge except for transportation costs. It is a good argument in favor of health center work which should help materially in convincing a skeptical community that the work is valuable and comparatively inexpensive.

Educational Motion Pictures in Vienna

THE United States Assistant Trade Commissioner at Vienna, Ernest M. Zwickel, sends the following information concerning the use of motion pictures for educational purposes:

"The city of Vienna has appropriated the sum of 560 million crowns for the purpose of introducing motion pictures in the Vienna schools for educational purposes. The Vienna municipal authorities realize the advantages of this form of education and have decided to equip 15 schools with motion picture equipment and apparatus. These are to be known as "Schoolkinos." Nine Vienna schools were already displaying pictures for the citizens of their communities. The municipality has taken over six of these and will open nine more schools, totaling 15, in order that motion pictures may be shown for educational purposes. It is proposed to have these 15 schools open free to school children exclusively."

A City Which Is Not Seeking Mere Increase in Population

THE following paragraphs are from a recent report of the Chamber of Commerce of Berkeley, Calif., to its members:

"Again and again the Berkeley Chamber of Commerce has called attention to the thought that the primary need of sound development of a city is not numbers but quality in population. What is really essential is for the citizens to provide the facilities for a superior commonwealth, and this in itself will attract superior residents. Ample school facilities, ample playgrounds, ample parks and boulevards all cost money, but are a guarantee of bringing good neighbors to live in our midst. A municipal symphony orchestra will do a hundredfold more to attract worth-while people to visit and to live in a city than the mere advertising of the city.

"The Chamber of Commerce, in its publicity, in its publications and in its activities has been broadcasting this message to the country. Berkeley is inviting the most cultured, the most far-seeing and the most public-spirited people of the land to come here and join with us in building the city of to-morrow which will be a leader in the development of the Pacific Ocean region. We believe that the people who are coming to Berkeley in such large numbers are for the most part those who are attracted by such ideas."

A Civic Ideal for Which Men and Women Might Strive Together

It is only when men and women work together, that they can make of the individual household a completed home, a happy place where all who come therein find life abundantly.

Therefore, it will be only as men and women learn to work together that they will find the way to make of the world itself a home for all humanity, a happy place where every child and every human being shall have the opportunity and help they need—a chance for life—life more abundantly!

It is the woman's intuitive desire for purity, for all cleanliness, that leads mankind along that way.

Each woman knows that the most fundamental necessity in the right upbringing of children is cleanliness, not of the body only, but of the spirit. Women know how often girls in the crowded districts of the city are greatly tempted because they are unwilling and ashamed to bring their men friends to their own respectable homes and let the young men see the dirty streets and filthy conditions in which they live.

If the girls dare not go home, where do they go?

It does not require much imagination to understand the temptation to evil caused by such surroundings.

There is an old saying, "Cleanliness is next to godliness."

If we could really make the environment of every individual in the community clean—with their help—and keep the streets, back yards and houses permanently clean, we should have taken the first absolutely necessary step toward making possible for every one the attainment of a higher standard of life.

Cleanliness is the only strong and solid foundation upon which we can ever hope to build round all young, growing lives the environment which each one needs for perfect development.

KATHERINE BOWLKER,
President, The Women's Municipal League of Boston.

Fall maintenance saves Spring repair bills—

NOW is the time to get busy on road repairs. Don't wait for winter snows and heavy frosts to attack weak spots. Get after the bumps, holes and hollows. Make sure that your roads will be in good shape to withstand spring thaws and traffic.

"Tarvia K-P" is the universal patching material—good for every type of road. Liquid, easy to handle and apply, "Tarvia K-P" is not injured by freezing weather and no special equipment is necessary. Patches made with "Tarvia K-P" are dense, durable, and form a perfect bond with the road. And "Tarvia K-P" is exceptionally economical. "Tarvia K-P" goes further on the job—you need less per ton of stone.

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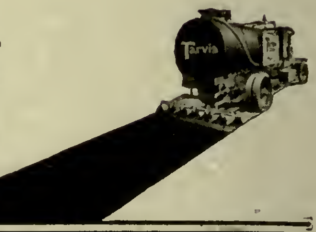

The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

City's Liability for Accidents

SINCE the main ground upon which cities and other municipalities may escape liability for accidents is that they are engaged in governmental functions as agencies of the state, it often falls to the courts to determine whether or not a given function is governmental in character or not. A general view of the trend of judicial decision concerning responsibility for acts of officers and employees of cities appears on pages 161 and 162 of the August, 1924, issue of THE AMERICAN CITY. It remains to note some important instances in which governmental functions have been held to be existent or non-existent.

An excellent illustration of the distinction between the exercise of governmental functions and mere ministerial or corporate powers is accorded by the decision handed down by the Iowa Supreme Court in the case of Jones vs. Sioux City, 170 Northwestern Reporter, 474. Concerning use of an automobile in connection with a municipal police department the Court said:

> "A city is liable for its negligence when it acts in a ministerial or corporate capacity. . . . It seems to us that, in order that the city may escape liability, the negligence complained of must bear some just and true relationship to the enforcement of law. If this automobile was being driven rapidly to quell a riot, or to protect the lives or property of citizens, then the speed of the car would bear a true relationship to the enforcement of law. . . .
>
> "If it be conceded, for the sake of argument, that the sole mission of the car in question and its driver was to haul policemen to their beats, could it be said that the city was acting in a governmental capacity? We think not. It could not be reasonably said that it is necessary for policemen to be hauled to their beats at the rate of 45 miles an hour, through the streets of a city. If it is a part of a city's policy to haul policemen to their beats in the outlying districts of a city, this is something which suits the convenience or economy of the city, and is an act which it does as a part of its general business, and does not relate to the enforcement of law. Such matters partake of the general or corporate business of the city."

In line with the reasoning of the Iowa court, it was decided in a Nebraska case (Opocensky vs. South Omaha, 163 Northwestern Reporter, 325) that operation of a fire department automobile on the street at an excessive speed, to test the machine, was not a governmental function.

But one of the Missouri Courts of Appeal decided that an automobile police patrol, carrying a prisoner to the police station, is engaged in a governmental mission. (Stater vs. Joplin, 176 Southwestern Reporter, 241.)

Concerning operation of motor vehicles in connection with a municipally operated public library, the Illinois Supreme Court said in the case of Johnston vs. Chicago, 101 Northeastern Reporter, 960:

> "The conveyance of books from one library building to another, by means of an automobile, along the public highways, by employees of the city, is plainly a ministerial duty."

Another instructive opinion is that filed by the Nebraska Supreme Court in the case of Chaney vs. Riverton, 177 Northwestern Reporter, 845, concerning liability for street accidents. It was decided that defendant village was liable for injury to a pedestrian, caused by collapse of a platform which the municipal authorities had permitted to be placed in a street for use in connection with a Fourth of July celebration; the structure having existed long enough to fairly charge the authorities with knowledge concerning its condition. After referring to the village's statutory authority over streets—the authority being conferred in language commonly used throughout the several states in granting such powers—the Supreme Court said:

> "Under this power of full control, conferred for the public good, the village was required to exercise due care in keeping its streets free from such structural defects or obstructions, or such physical conditions in immediate connection therewith, as would impair its use or endanger those traveling upon it. . . .
>
> "In the cases just above cited, the condition produced by a brick wall of a building, after a fire, left standing next to the sidewalk, and in danger of falling on those using the street; or a billboard in a weakened or decayed condition, standing so that it might be blown into the street; or a platform built in the street, such as the one in the instant case,—was, in each case where in-

FERRY AVENUE, Detroit, Mich., paved with Trinidad Lake Asphalt in 1887.

37 years old—*still good*

Think of it! Thirty-seven years of service—still in good condition—and *very little spent on it for maintenance to date!*

This is the record of the Trinidad Lake Asphalt Paving on Ferry Ave., Detroit, Mich.—laid in 1887. *What other smooth-surface paving material can equal it?*

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volved, held to be a nuisance in connection with the street, and which the city was obliged to use due diligence in discovering and removing.

"Such a duty it owes in its private or corporate capacity, and not in its governmental capacity. Those cases, therefore, having to do with a nuisance created upon the street by the active use of it, such as by riots, the shooting of fireworks or cannons, or by horse races or coasting on the snow, are to be distinguished, for in such cases the nuisance has no structural connection with the street nor with the surrounding physical conditions, but is an unlawful proceeding upon the street, which the city is called upon, in its governmental capacity to prevent, and for failure to do so, since it acts in its governmental capacity, it is not held liable."

In the case of Fowler vs. City of Cleveland, 126 Northeastern Reporter, 72, the Ohio Supreme Court aptly said:

"The line of demarcation between acts which are termed governmental and those which are ministerial or proprietary, done in the performance of a corporate function, has not been accurately defined in cases where the liability of a municipality was involved. It is, of course, everywhere recognized that the exercise of the legislative will is governmental. The power to determine whether certain steps shall be taken in the interest of the public welfare is governmental, and the exercise and expression of the discretion as to the kind of steps, and the extent of them, are governmental. But a municipal corporation is a vastly different thing now from what it was in the early days. . . .

"Now, the activities and undertakings of a municipal corporation are manifold. . . . It seems to be utterly unreasonable that all these activities and enterprises which are brought closely home to the lives of all of the people of the municipality must still be regarded as bound up in the vague and uncertain sphere of what is called a governmental function. . . .

"A modern city may be said to be a great public service corporation, and no reason is apparent why, in the respects in which it intrusts purely ministerial duties to agents and employees, it should not be subject to the liabilties of such persons and companies."

Sundry Items of Municipal Law

Private Structure Erected Without Authority Over Sidewalk Constitutes a Nuisance

Where an owner or occupant of property abutting upon a street erects a private awning or shed, covered with corrugated iron and supported by posts near the curb, and extending over the sidewalk, it constitutes a nuisance, whether it interferes with public travel or not, if it is erected without legal authority. (West Virginia Supreme Court of Appeals, City of Martinsburg vs. Miles, 121 Southeastern Reporter, 285.)

County's Responsibility Concerning Bridges

In the recent case of Travers vs. Delaware County, 124 Atlantic Reporter, 496, the Pennsylvania Supreme Court decided that the plaintiff had failed to establish such negligence on the part of the defendant as to render it liable for injuries resulting from collapse of a bridge.

Speaking generally of the responsibility of counties, the Court said:

"To recover, it was necessary that lack of some due precaution for the protection of the public be established. The bridge had been in use for more than 30 years, and failure to take proper care cannot be rested on the original manner of design or building . . . for there was no evidence to show that the plan followed was so defective as to make its adoption an act of negligence. Of course, it is the duty of the county commissioners to make such inspections as are from time to time required, so that the bridges within their control—part of the public highways—are kept in safe condition, and suitable for the movement of traffic reasonably to be expected to pass across. To effect this end, they must employ suitable engineers to perform the service of inspection so that the strength of the structures committed to their care may be determined. . . . When defects are brought to their attention, necessary changes must be made, and the highway closed in the meantime if there is apparent danger. . . . To secure such result, it must take advantage of the skill of an expert of good repute, when conditions so require."

Right to Use Private Sewer as Part of Public System

Where a sewer, laid by a private owner in a public highway, connects with another sewer serving a suburban community, and the city limits are thereafter extended to include both sewers, the suburb, and other contiguous territory, that part of the highway under which the sewer is laid becoming a part of the city's system of streets, and it is found necessary in the interest of public health, convenience, and welfare for the city and its inhabitants to use such privately constructed sewer, neither the city nor its inhabitants will be enjoined from such use, where the city offers to pay to the owners a reasonable compensation for the public ownership of the sewer. (West Virginia Supreme Court of Appeals, Stifel vs. Hannan, 123 Southeastern Reporter, 428.)

Refusal of Court to Declare an Ordinance Void Merely Because It Fails to Conform to Best Engineering Practice

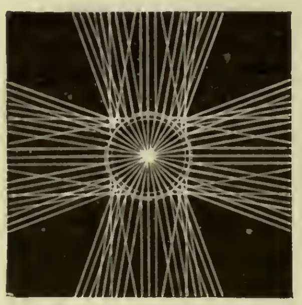
In the case of Van Hecks vs. City of Stevens Point, 198 Northwestern Reporter, 732, it was claimed that an ordinance originally establishing the grade of a street was void because it provided for a fall of one-tenth of a foot in approximately 287 feet. Responding to that contention, the Wisconsin Supreme Court said:

"We are cited to no case, and we find none, which sustains the city's position. Ordinances which are unreasonable may be declared void, but it is not within the province of a court to declare an ordinance void merely because it fails to conform to the best engineering practice."

THE AMERICAN CITY is indebted to the Boston Chamber of Commerce for the photograph taken by the U. S. Army Air Service, which is reproduced on the front cover of this issue.

Assymetrical

The word that is
revolutionizing
street lighting.



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HERETOFORE street lighting units have distributed the light *symmetrically* around the lamp, and consequently a large part of the light has been wasted on house fronts and lawns.

Now Holophane offers two *as*symetrical units, which direct the light in only four or two directions, thus keeping the light on the street and giving from 40% to 50% more illumination from a given amount of current than have the best previous units.

Above is illustrated the light distribution of the 4-Way Refractor.

Your city should standardize on these units now. Write for booklet.

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Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources

For further information, Mr. Williams may be addressed in care of
THE AMERICAN CITY MAGAZINE, 443 Fourth Avenue, New York

Zoning Ordinances and Enabling Acts Not Previously Listed

CALIFORNIA.—*Burbank (1923), *Burlingame (1923), *Glendale (1922), *Inglewood (1924), *Redwood City (1921), *San Mateo (1922), *Torrance (1923), *Ventura (1924), ordinances
FLORIDA.—*Orlando, ordinance, 1924
MASSACHUSETTS.—*Malden, ordinance, 1923
NEVADA.—Enabling Act, March 10, 1923
NEW JERSEY.—*Fanwood (1924), *Linden (1921), *Pompton Lakes (1923), ordinances
NEW YORK.—*Elmsford (1924), *Hastings (1923), *Rockville Centre (1924), ordinances
NORTH DAKOTA.—*Bismarck, ordinance, 1924
OKLAHOMA.—*Tulsa, ordinance, 1923
VIRGINIA.—Norfolk, ordinance, August 19, 1924
WISCONSIN.—*Beloit (1924), Kenosha (1924), ordinances

Recent Zoning Decisions

NEW YORK.—*City of Syracuse v. Snow,* 123 Misc. Rep. 568. Injunction to restrain defendants from conducting the business of a sorority or chapter house in a single-family use district, contrary to the zoning ordinance. Action dismissed. The running of a sorority as here conducted is not a business. The sorority is a single, private family. The prohibition of such an establishment does not tend to insure the public health, safety or welfare, and is not authorized by legislation authorizing the city to promote it. The defendant who contracted to sell her house, since she could obtain $6,000 more for it for this use than for any other, was deprived of her property without due process of law by the regulation in question.

NEW YORK.—*Welch v. City of Niagara Falls,* 210 App. Div. 170. An amendment to the zoning ordinance prohibiting a wholesale or retail coal business was passed by the council without a previous reference of the matter to the Zoning Commission, as required by the charter. *Held,* that it was not validly enacted. Nor is the passage of the amendment authorized by Sec. 56 of the charter, empowering the council to pass ordinances for the general safety and welfare. While a coal business may be objectionable in some ways, it is not a nuisance. The ordinance can only be justified as an exercise of the zoning power under zoning enabling acts. The city claims that the business can be excluded from the district under a section of the ordinance as it exists, without amendment. The interpretation of the section is not free from doubt, and as it is a restriction of the common law and of a general law to pursue a legitimate and innocent occupation, it must receive a strict construction.

WISCONSIN.—*Holzbauer v. Ritter,* 198 N. W. Rep. 852. Where the erection of a store building, in violation of a zoning ordinance, might cause special damage to property of plaintiffs not suffered by the general public, they could sue to enjoin such erection in order to prevent irreparable injury.

Where a zoning ordinance required a three-fourths vote of the council for amendments protested by property owners, and the clerk failed to present before vote, protests to an amendment excluding a community store from a residential district, the amendment was held invalid, especially in view of the statute (1923, sec. 62, 23, subs. 5 c) providing for a three-fourths vote in cases of protest.

A zoning ordinance restricting the erection of a community store in a residential district held constitutional.

Recent Zoning Literature

Bulletins of Federal Department of Commerce.—The Department of Commerce at Washington has issued a comparative statement of the use and height regulations of the zoning ordinances of sixteen cities. The statement was prepared by the Advisory Committee on Zoning, appointed by Secretary Hoover, and is a mimeograph pamphlet of twenty-six pages.

The department has also issued a "Supplement to its 'Zoning Progress in the United States' of January, 1924," giving additional zoning ordinances adopted. These ordinances, in so far as they have not already been mentioned in these notes, are (with the exception of interim ordinances) given in our list of ordinances for this month. The supplement says that the number of ordinances now in effect in this country is 261.

In addition, the department has prepared a table of the acts of states, thirteen in all, which have used the Department's standard enabling act in whole or in part, since its tentative publication in 1923. The Department is also sending out a leaflet showing recent benefit from zoning legislation. Approximately 24,000,000 people in the United States now live in zoned localities.

Baltimore Zoning Code.—Albert M. Greenfield, Esq., has prepared a book of 167 pages entitled "Zoning Code for Baltimore." It is the zoning ordinance of the city arranged for easy reference, with an appendix of rulings, court decisions, amendments and other pertinent laws and ordinances. Such books are to be found in other branches of the law, but the volume is an innovation in zoning which will be greatly appreciated by all whose business it is to know and use the Baltimore ordinance.

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*The ordinances starred are listed in the "Supplement" of the Department of Commerce, referred to below.

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When we are old enough to vote, you won't have to convince *us* that playgrounds are necessary. When a playground appropriation or bond issue comes up, we'll vote Y E S, willingly and gladly.

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THE FUN-FUL LINE
PLAYGROUND EQUIPMENT

The Municipal Bond Market

By Sanders Shanks, Jr.

Editor, *The Bond Buyer*

THE year 1924 promises to be a record year for municipal financing. The aggregate for the first eight months of the year is $1,036,218,624. The total for the entire year 1923 was $1,111,159,388, less than $75,000,000 more than this year's figures to September 1. It is probable that the final 1924 figure will be close to that of 1921 when the peak of municipal financing was reached. The total that year was $1,383,368,900.

The final September figures will show a marked decline in comparison with previous months. Possibly many municipalities which normally would have been in the market in September and October took advantage of the July and August market to dispose of their authorized issues at high prices. The result, as indicated above, is seen in the unusual volume of borrowing in the first eight months of the year. The only offering of major importance announced for sale in September is the state of New York's $12,500,000 4 per cent Hospital Loan. This block is the initial offering of a $50,000,000 issue authorized last year.

Municipal bond price averages indicated that the market advanced gradually through August and are to-day at about the level of the fall of 1922 and not far below the high prices reached early in 1917, prior to this country's entrance into the World War:

IMPORTANT MUNICIPAL BOND SALES IN SEPTEMBER

Amount	Borrower	Maturity	Coupon Rate (%)	Net Yield (%)
1,980,000	Buffalo, N. Y......	1925-54	4¼	3.95
1,365,500	Binghamton, N. Y..	1925-71	4¼	4.07
500,000	Johnstown, Pa.	1925-54	4¼	4.15
349,000	Camden, N. J.......	1925-74	4¼	4.16
712,500	Milwaukee, Wis.	1925-43	4½	4.17
1,960,000	Hudson Co., N. J...	1926-54	4½	4.30
2,400,000	Mississippi	1935-48	4½	4.37
1,599,000	Bayonne, N. J.......	1925-53	4½	4.41
470,000	Lowville, N. Y.....	1929-91	4½	4.42
1,000,000	Los Angeles Co., Calif.	1928-47	5	4.48
400,000	Black River Regulating Dist., N. Y...	1925-74	5	4.60
4,473,000	Salt River Valley Water Users Assn., Ariz.	1925-54	6	6.24

The Small Town's Opportunity

As Seen by Two Automobile Manufacturers

HENRY FORD, *as quoted in an interview with Drew Pearson, in the September "Automotive Industries"*:

"The modern city has done its work and a change is coming. The city has taught us much, but the overhead expense of living in such places is becoming unbearable. The cost of maintaining interest on debts, of keeping up water-supply, sewerage and sanitary systems, the cost of traffic control and of policing great masses of people, are so great as to offset the benefits of the city. The cities are getting too heavy and are about doomed.

"Industry of the future will be organized on a big scale, but competition will force it to move to parts of the country where labor is steady and overhead costs low.

"The farm has its dull season, when the farmer can come into the factory, and the factory has its dull season when the workmen can get out on the land and help produce food.

"Every man is better off for a period of work under the open sky, and while we cannot afford the time to go off for three or four months of the year to dawdle around some fancy summer resort, yet we can escape the routine of the factory and the monotony of the farm by an exchange of labor during the slack seasons."

WALTER P. CHRYSLER, *President, Chrysler Motor Corporation and Maxwell Motor Sales Corporation, in the September "Public Affairs"*:

"Seventy-five per cent of all the cars in the United States are in towns of less than 50,000. Thirty per cent are in towns of less than 1,000. Only nine per cent are in towns of more than 500,000.

"This is not surprising when it is remembered that nearly half of our population lives in towns of less than 2,500. A third of the population lives in towns of less than 1,000.

"The automobile has resulted in a shifting of population. First, it has resulted in a disintegration of urban life and the development of suburban life, and, secondly, it has been largely responsible for the beginning of the elimination of the village and the development of towns having a population of from 1,000 to 5,000.

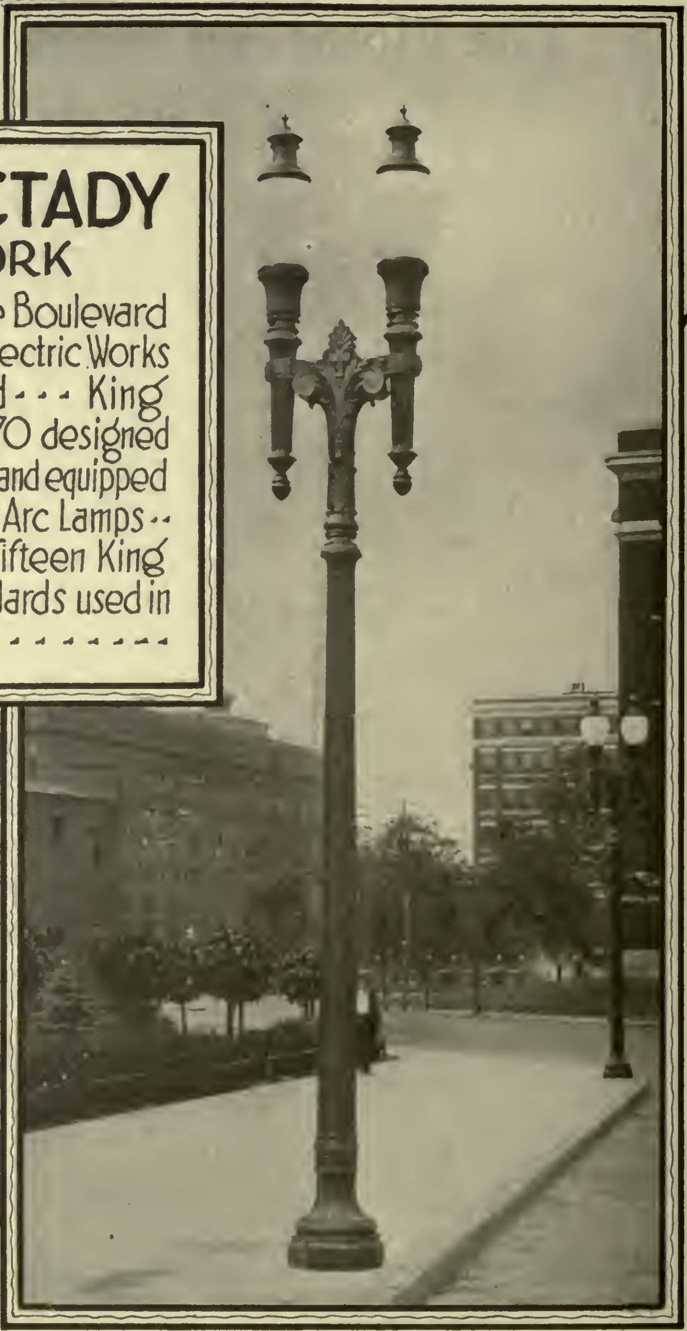
"The resident of the village has hopped into his car and has 'taken a ride' to the next town. There he saw better churches and schools, a larger theater, more opportunity for social life, with the result that he decided to move. Many thousands of families have moved, and many have remained where they were because the city fathers saw that if they didn't want their town to disappear they would have to provide better schools and even a park and playground.

"Then the small-town resident went to a town where they had a municipal swimming pool and a municipal golf links. Again he decided to move, but again the authorities decided to build a pool and a links rather than lose its young men. So swimming pools, golf links and tennis courts are to be found in a great many places because cities without them have trouble holding their inhabitants.

"The automobile is rapidly eliminating the little red schoolhouse. To-day children attend consolidated county schools—in fact, 300,000 boys and girls ride every day to those schools in motor busses operated by counties."

SCHENECTADY
NEW YORK

Looking down Erie Boulevard with the General Electric Works in the background - - - King Standard Number 70 designed by General Electric and equipped with G-E Luminous Arc Lamps - - One hundred and fifteen King Ornamental Standards used in this installation - - - - - - - -



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ORNAMENTAL LIGHTING STANDARDS

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From the International Union of Cities

Items translated from "Tablettes Documentaires Municipales" by Stephen Child, 410 Maryland Building, Washington, D. C., to whom requests for further information regarding this source of civic documentation should be addressed

Technical Improvements in Vienna. 61.347+62.81 (43.6)

1. Municipal Baths.—The city of Vienna to-day has 38 bathing establishments, 20 of which are furnished with warm water; 18 have merely out-of-door facilities.

2. Public Laundries.—The keeping in good condition of the linen used in the numerous municipal establishments makes it more and more necessary to establish a great steam laundry. This purpose has been achieved through the purchase and extension of former military laundries.

3. Municipal Repair Shops.—These have for their object the making of all sorts of repairs to both machines and buildings owned by the city. It is interesting to note that in these shops arrangements are made for apprenticing war orphans and teaching them useful trades.

4. Water-Supply.—This is assured through 18 reservoirs with a total capacity of 333,300 cubic metres. What is quite exceptional is that the entire supply is from springs. To the water distribution or pumping-stations are attached supply yards for the storage and testing of pipes.

Aspect of the Street.—Construction on Empty Lots Between Buildings—Germany. 71.311 (43)

The German Public Academy of City Planning notes that of late years the intervals between the high buildings along various streets are often filled with small houses occupied by one family, leaving above them the bare walls and high roofs of the neighboring buildings. Since regulations now in force have not permitted up to the present time the making of any opposition to such disfigurements of the street, all authorities responsible for such condition are urged to make an effort to remedy this state of affairs as soon as possible by means of ordinances. Whenever possible, they should negotiate with those intending to build such structures and propose an exchange of the lot for another situated in a district reserved for low building.

Urban Esthetics.—Accessories of the Street—Paris, France. 72.509.25 (44.361) (079.1)

On the occasion of the forthcoming Exposition of the Decorative Arts, the city of Paris is organizing a competition in regard to fixed or movable furniture and other objects along the public streets and promenades, such as kiosks, benches, lighting apparatus and various other small structures, examples of which of the present day go back for the most part to the Second Empire and harmonize quite badly with the decorations of the Capitol of France. The competition is open to all French people and closes the 11th of October, 1924. A public exhibition of all the projects received will follow the decision of the jury. The designs and models of the projects given prizes will be exhibited in the pavilion reserved by the city of Paris at the Exposition of Decorative Arts in 1925.

Municipal Mortgages in North Holland. 33.332 (492.62)

While recent government orders have stopped construction by building societies and by towns, it is interesting to note that the city of Amsterdam has adopted orders which assure the completion of a new district—West Amsterdam—which will include at first 400, later 2,000, and finally 6,000 workmen's houses. The funds will be loaned by a reliable bank up to two-thirds of the value of the property pledged as security, the city guaranteeing the payment of the interest and the amortization of the loans.

The Reconstruction of Belgrade, Serbia. 33.332 (497.1)

Many great new buildings have been reconstructed with modern comforts at Belgrade, due in part to private initiative but in part also to the impulse given by the law in regard to obligatory construction of buildings. Soon large and sumptuous public buildings will also embellish the city under the provisions of the same law.

Building Regulations in Holland. 35.177:61.485 (492)

Municipal building regulations vary greatly from one city to another in Holland to such an extent that no two are alike on all matters generally regulated: floor area of houses and apartments; height and other dimensions of buildings affecting light and air; thickness of walls, details of stairways, etc. A writer in the *New Rotterdam Courant,* noting these divergencies, suggests a uniform ordinance for the entire country. There is, however, considerable opposition to this suggestion, for the question is a complex one with many aspects. The tendency in England to set up essentially uniform health regulations and enough variation in other regulations to fit the diverse conditions of rural towns and large cities is approved.

The Purification of the Water of Swimming Pools. 61.347

A Special Committee of the Royal Sanitary Society of London, England, has been studying this question very thoroughly and now reports the following general conclusions: Mechanical aeration and filtration give excellent results. The water of a swimming pool aerated and filtered in a continuous manner is bacteriologically superior to water of a pool not treated and renewed at regular intervals. Such water becomes dirty in a day or two and becomes excessively dirty if it is used for several days. As a measure of extraordinary precaution it is advised to treat the water of swimming pools with chlorine at the end of a long period of warm weather when the pool is much used and when the social conditions of those using it are not good.

From the point of view of economy, an installation of mechanical filtration and aeration is almost always more economical than a daily renewal of the water of the pool with pure water. From the point of view of health, even with suitable mechanical filtration methods installed, it is better to totally renew the water every 4 or 6 weeks in summer when there are many bathers. It is well to profit by this process of completely renewing the water to thoroughly clean the pool. All persons entering the pool should be clean and to this end shower- and other baths should be installed.

Improved Apparatus for the Treatment of City Waste in France. 62.849 (44)

Improved apparatus has been developed in France for drying and sterilizing city waste before incineration in order to save the greatest amount of heat possible. This apparatus consists of a long oven in the form of a tunnel with double walls, in which a movable metallic platform slowly circulates, carrying the wastes to be dried. Between the two walls hot gas circulates, raising the temperature of the interior of the tunnel to more than 200° C. On coming out of the tunnel the completely dried dirt falls onto a horizontal conveyor where sorting is accomplished by hand, and is then conveyed to a sieve (3 to 5 millimeter mesh) which removes about 15 per cent of the cinders. Finally, they are spread on a special grating where they may burn freely. The cinders gathered together, still hot, are heaped up outside, where they become completely oxydized. When ground this product lends itself to the manufacture of ceramic products, when mixed with a small quantity of very plastic clay and the mixture moulded, compressed and burned at a temperature of 900° C.

Housing Colonies and Improvement of the Soil at Zurich, Switzerland. 71.43:63.15 (494.34)

Important work in regard to the improvement of soil conditions, as well as the establishment of housing colonies, has lately been undertaken at Zurich. The improvement of the soil dates from the last years of the war, when the need for food supply and for furnishing occupation for those out of work made the improvement of waste areas important. Marshes were drained and rendered suitable for crops. The work was accomplished in part by the Technical Bureau of the canton and in part by the Agricultural Industrial Institute. From these sources later, there was developed the "Union for Colonization" of the interior of the canton. After the work of improvement of the soil was completed, the "Union" devoted itself to the colonization of the districts newly opened to cultivation. This colonization is in part of an urban industrial nature and in part of an agricultural nature, and in both cases the tenants may acquire ownership of the property. This soil improvement work and these housing colonies are, in fact, improvement works in the best sense of the word; as a result, wealth is created which will have a very beneficial effect in the near future.

The Problem of Removing Snow from City Streets or Country Roads is easily solved by using a

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Municipal and Civic Publications

Prices do not include postage unless so stated

Hydraulics Applied to Sewer Design.—By G. S. Coleman, Senior Lecturer in Municipal and Sanitary Engineering, the Municipal College of Technology, Manchester, England. D. Van Nostrand Company, New York. 1923. VIII + 150 pp. Diagrams, tables. $4.00.

A well-prepared treatise on the application of the theory of hydraulics to sewer design, based on the author's English experience and considerable material borrowed from standard American text-books and periodicals. The specific chapters are devoted to a general discussion of data for use in calculations, a discussion of various discharge formulae for channels, and the discharge of weirs. Five appendices develop the theoretical formulae used in the text.

Emergency Water Supplies for Military, Agricultural and Colonial Purposes.—By A. Beeby Thompson, Attached to Headquarters Staff of Mediterranean Expeditionary Force, British Army, 1915-1919. D. Van Nostrand Company, New York. 1924. XII + 180 pp. $6.50.

A book based on experience gained during the operations of the Mediterranean Expeditionary Forces, 1915-1919, and containing special reference to the use of tube wells and drilling. This book is published with the consent of the British War Office, as it is impossible to publish this material as an official publication. The experience of the author gave exceptional opportunities for continuous and close study of highly diversified water problems, upon the solution of which the health of troops and animals often depended. The book is not intended as a text-book on hydrology, but contains a concise statement on the principles guiding water prospecting. Particular attention is given to tube wells, which had previously been neglected, but which it was found could supply large quantities of water at two hours' notice.

Sheffield: A Civic Survey and Suggestions towards a Development Plan.—Report by Patrick Abercrombie, of the Department of Civic Design, University of Liverpool, on the scheme prepared for the Development Committee in collaboration with R. H. Mattocks. Published for The University Press of Liverpool Limited, by Hodder and Stoughton, Limited, London. 1924. XI + 85 quarto pp., besides many views, maps and drawings. 20 shillings.

An elaborate presentation of the facts regarding Sheffield's topography, history, population, industrial, traffic and transportation conditions, its health and housing, and its business, educational and recreational facilities, with plans for the future development of the city. The proposals for this development are grouped under the divisions of zoning, road suggestions, grouping of the population, central improvements, park system, neighborhood centers and satellite suburbs, modern methods of suburban growth, intellectual and artistic center, improvement of water transport, and railways.

Elements of Land Economics.—By Richard T. Ely, LL.D., Director of the Institute for Research in Land Economics and Public Utilities, and Professor of Economics in the University of Wisconsin; and Edward W. Morehouse, M. A., Research Instructor in the Institute of the University. The Macmillan Company, New York. 1924. XVIII + 353 pp. Views, maps, diagrams. $3.50.

This is Volume II in the Standard Course in Real Estate, outlined by the Joint Commission representing The National Association of Real Estate Boards, the United Y. M. C. A. Schools and The Institute for Research in Land Economics and Public Utilities. The books in the Land Economics Series, to which this volume furnishes an introduction, will deal, first, with land as an economic factor, and second with land as a commodity. Improvement of the social conditions of living should be the purpose of policies and plans of land utilization. This book is a study of how this end may be accomplished.

The Design and Operation of Sewage Pumping Stations.—By C. S. Timanus, of Burns and McDonnell Engineering Company. A paper presented at the Fifth Conference on Sewage Treatment, held at Ames, Iowa, October 22-24, 1923. Bulletin 62 of the Engineering Extension Department, Iowa State College, Ames, Iowa. Published November 14, 1923. 9 pp. Illustrated. A general, yet definite discussion of the subject. (Apply to the Engineering Extension Department.)

Elements of Water Bacteriology.—By Professor Samuel Cate Prescott and Professor Charles-Edward Amory Winslow, of the Massachusetts Institute of Technology, and the Yale School of Medicine, respectively. Fourth Edition, rewritten. John Wiley & Sons, Inc., New York. 1924. VIII + 211 pp. $2.25.

This book, which has nearly reached its majority, has long since been accorded first place as the standard text and reference book on water bacteriology. The rapid progress of this branch of applied science necessitated the editions of 1908 and 1915. The present book has important changes in its text relating to the increased definiteness and precision in the use of the colon test to the isolation of the typhoid bacillus, and a revised bibliography on the subject of water bacteriology. The authors presuppose the reader's knowledge of the Standard Methods of Water Analysis of the American Public Health Association, hence several of the chapters have been condensed and the space devoted to new recommendations.

Non-Voting—Causes and Methods of Control.—By Charles Edward Merriam and Harold Foote Gosnell, Professor and Instructor, respectively, in Political Science in the University of Chicago. The University of Chicago Press, Chicago. 1924. XVI + 287 pp. 1 illustration. $2.50.

Six thousand non-voters in the Chicago mayoralty election of April 3, 1923, were interviewed in the investigation for this study made under the auspices of the Local Community Research Committee of the University of Chicago, and additional data were secured from Federal and local political officials and election workers. The book contains definite, first-hand, human information of value to civic leaders, students of government, and present and potential voters. It classifies the causes of non-voting under the heads of physical difficulties, legal and administrative obstacles, disbelief in woman's voting, disgust with politics and other disbeliefs in voting, and general indifference and inertia, and it suggests methods of controlling non-voting.

Seasonal Operation in the Construction Industries—The Facts and Remedies.—McGraw-Hill Book Company, Inc., New York. 1924. XXX + 213 pp. Diagrams, tables. $2.50.

Report and recommendations of a committee of the President's Conference on Unemployment, with a foreword by Herbert Hoover, who says in his analysis of the committee's report: "For most types of construction it is now possible to build the year round in all parts of the United States"; and "Public works are especially well adapted for scheduling with reference to seasonal as well as cyclical conditions, and the efforts to encourage long range planning of public works deserve the support of the public, legislators and administrative officials." Cooperative action among the trades, the professions and the public in planning a more even demand for construction work and in eliminating waste is shown to be essential, and the problem one for individual and community initiative, not for government regulation.

The Government of Cincinnati and Hamilton County.—A Survey directed and edited by Lent D. Upson, Director, Detroit Bureau of Governmental Research; Professorial Lecturer in Political Science, University of Michigan. 1924. 535 pp. Apply to Mr. Upson or to the City Survey Committee, Citizens Bank Building, Cincinnati, Ohio.

A report to the Republican Executive and Advisory Committee of Hamilton County, Ohio, by the City Survey Committee, based upon a survey of the governments of the city of Cincinnati and Hamilton County, and of the business activities of the Board of Education. Including suggestions for the more economic and efficient administration of the city and county governments, for the coordination of city and county activities, and additional sources of revenue, and reports on the budget procedure, business methods and building construction of the Board of Education.

Additional Ground-Water Supplies for the City of Enid, Oklahoma.—By B. Coleman Renick. Water-Supply Paper 520—B, published by the United States Geological Survey of the Department of the Interior, Washington, D. C. 14 pp. Illustrated. This survey of sources for increased water-supply does not cover estimates of the costs of installation. (Apply to the Government Printing Office, Washington, D. C.)

International Motor Trucks

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INTERNATIONAL Model 103, illustrated, is a most efficient unit for heavy hauling. The heavy-duty models are built in 3,000, 4,000, 6,000, and 10,000 pounds, maximum capacities, with bodies to meet every requirement. The International Speed Truck, built for loads up to 2,000 pounds, is a popular favorite for fast, light hauling. Upon request, we will gladly supply you with detailed information and the address of the nearest showroom where the full line of new models is on display.

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The Present Status of Stream Pollution in Iowa.—By H. V. Pedersen, State Sanitary Engineer. A paper presented at the Fifth Conference on Sewage Treatment, at Ames, Iowa, October 22-24, 1923. Bulletin 63 of the Engineering Extension Department, Iowa State College, Ames, Iowa. 9 pp. Illustrated. Setting forth the great need of a definite stream pollution program in Iowa, and the means by which such a program may be undertaken. (Apply to the Engineering Extension Department, Iowa State College, Ames, Iowa.)

Water-Supply, Spartanburg, S. C.—Report, dated January 5, 1924, by P. H. Norcross, consulting engineer, upon the existing conditions, and conclusions and recommendations as to the best program for future development of the water-supply of Spartanburg. Also a brief supplemental report with the recommendation that detailed plans be prepared immediately and the necessary property, water rights and rights of way secured. 51 quarto pp. with tables, besides many maps and diagrams. (Apply to P. H. Norcross, consulting engineer, 1404 Candler Building, Atlanta, Georgia.)

Municipal Reports Received

BUFFALO, N. Y.—Annual Report, Department of Health, 1923
CEDAR RAPIDS, IOWA.—Report on Water-Works Improvements Authorized March 27, 1922
COLUMBUS, GA.—Report of City, 1922, 1923
DAYTON, OHIO.—Annual Report, 1923
EAST ORANGE, N. J..—Annual Report, 1923
FALL RIVER, MASS.—Annual Report, Board of Health, 1923
HERKIMER, N. Y.—Annual Report, Municipal Commission, year ending February 29, 1924
HOLYOKE, MASS.—Annual Report, City Treasurer, 1923
MONTCLAIR, N. J.—Annual Report, Board of Health, 1922
SAINT LOUIS, MO.—Annual Report, City Plan Commission, year ending April, 1924
ST. PAUL, MINN.—Annual Report, Bureau of Civil Service, 1923
SPRINGFIELD, VT.—Annual Report, Town Officers, year ending February 1, 1924; Annual Report, Village Officers, year ending March 8, 1924
TULSA, OKLA.—Annual Report, Engineering Department, year ending May 1, 1924

On the Calendar of Conventions

OCTOBER 6.—WORCESTER, MASS.
Massachusetts Federation of Planning Boards. Annual conference. Secretary, Arthur C. Comey, Abbot Building. Harvard Square, Cambridge, Mass.

OCTOBER 6-9.—WASHINGTON, D. C.
American Institute of Park Executives. Annual convention. Secretary-Treasurer, Will O. Doolittle, Box 548, Minot, N. Dak.

OCTOBER 6-9.—WASHINGTON, D. C.
American Red Cross. Annual convention. Secretary, Miss Mabel T. Boardman, National Headquarters, Washington, D. C.

OCTOBER 6-9.—LAWRENCE, KANS.
Southwest Water Works Association. Annual convention. Secretary, R. D. Morgan, Mexia, Tex.

OCTOBER 6-10.—ATLANTIC CITY, N. J.
American Electric Railway Association. Annual meeting. Executive Secretary, James W. Welsh, 8 West 40th Street, New York, N. Y.

OCTOBER 6-10.—MONTEREY, CALIF.
League of California Municipalities. Annual convention. Executive Secretary, William J. Locke, 564 Market Street, San Francisco, Calif.

OCTOBER 8-10.—WASHINGTON, D. C.
American Civic Association. Annual convention. Secretary, Miss Harlean James, Union Trust Building, Washington, D. C.

OCTOBER 8-10.—EMPORIA, KANS.
League of Kansas Municipalities. Annual convention. Secretary-Treasurer, John G. Stutz, Lawrence, Kans.

OCTOBER 13-15.—LOS ANGELES, CALIF.
American Association of Port Authorities. Annual convention. Secretary, Tiley S. McChesney, Room 200, Court Building, New Orleans, La.

OCTOBER 14-16.—KANSAS CITY, MO.
American Child Health Association. Annual meeting. Secretary, Dr. Philip Van Ingen, 370 7th Avenue, New York, N. Y.

OCTOBER 14-17.—AUGUSTA, GA.
International Association of Municipal Electricians. Annual convention. Secretary, W. R. Arbuckle, Bayonne, N. J.

OCTOBER 16-17.—CHICAGO, ILL.
Illinois Municipal League. Annual convention. Secretary, A. D. McLarty, Urbana, Ill.

OCTOBER 16-17.—COLUMBUS, OHIO
Ohio State Conference on City Planning. Annual conference. Secretary-Treasurer, Charlotte Rumbold, 201 Chamber of Commerce Building, Cleveland, Ohio.

OCTOBER 16-21.—ATLANTIC CITY, N. J.
Playground and Recreation Association of America. Annual Recreation Congress. Secretary, H. S. Braucher, 315 Fourth Avenue, New York, N. Y.

OCTOBER 20-22.—WASHINGTON, D. C.
National Association of Commercial Organization Secretaries. Annual meeting. Secretary-Treasurer, Raymond B. Gibbs, Chamber of Commerce, Kansas City, Kans.

OCTOBER 20-23.—DETROIT, MICH.
American Public Health Association. Annual meeting. Secretary, Homer N. Calver, 370 Seventh Avenue, New York, N. Y.

OCTOBER 22-24.—ANDERSON, IND.
Indiana Municipal League. Annual meeting. Secretary, Mrs. Bessie B. Ross, City Clerk, Gary, Ind.

OCTOBER 23-25.—DETROIT, MICH.
American Society of Civil Engineers. Fall meeting. Assistant Secretary, Z. E. Beam, 33 West 39th Street, New York, N. Y.

OCTOBER 27-31.—BRIARCLIFF MANOR, N. Y.
Illuminating Engineering Society. Annual convention. General Secretary, Norman D. Macdonald, 80th Street and West End Avenue, New York, N. Y.

NOVEMBER 5-8.—HOUSTON, TEX.
Texas Association of Sanitarians. Annual Short School for Sanitarians, in cooperation with the Texas State Board of Health. Secretary, E. G. Eggert, Texas State Board of Health, Austin, Tex.

NOVEMBER 7-11.—COLUMBUS, OHIO
American Country Life Association. Annual conference. Secretary, Henry Israel, Room 1849, Grand Central Terminal Building, New York, N. Y.

NOVEMBER 10-12.—CAMBRIDGE, MASS.
National Association of Civic Secretaries. Annual meeting. Secretary, Robert E. Tracy, 313 South Broad Street, Philadelphia, Pa.

NOVEMBER 10-12.—CAMBRIDGE, MASS.
National Municipal League. Annual meeting. Secretary, H. W. Dodds, 261 Broadway, New York, N. Y.

NOVEMBER 11.—NEW YORK, N. Y.
Society of Terminal Engineers. Annual meeting. Secretary, Charles H. Newman, 36 Warren Street, New York, N. Y.

NOVEMBER 13-14.—AKRON, OHIO
Association of Urban Universities. Annual meeting. Secretary, Dean Frederick B. Robinson, College of the City of New York, New York, N. Y.

NOVEMBER 17-19.—SAN FRANCISCO, CALIF.
Association of State Highway Officials. Annual meeting. Secretary, Charles Upham, State Highway Engineer, Raleigh, N. C.

DECEMBER 1-4.—NEW YORK, N. Y.
American Society of Mechanical Engineers. Annual meeting. Secretary, Calvin W. Rice, 29 West 39th Street, New York, N. Y.

DECEMBER 10-11.—WASHINGTON, D. C.
National Rivers and Harbors Congress. Annual convention. Secretary, S. A. Thompson, 824 Colorado Building, Washington, D. C.

DECEMBER 11-13.—INDIANAPOLIS, IND.
National Society for Vocational Education. Annual convention. Secretary, F. G. Nichols, Harvard University, Cambridge, Mass.

DECEMBER 26-27.—CHICAGO, ILL.
National Community Center Association. Annual meeting. Secretary, LeRoy E. Bowman, 503 Kent Hall, Columbia University, New York, N. Y.

JANUARY 5-6.—CHICAGO, ILL.
International Association of Street Sanitation Officials. Annual conference. Secretary, A. M. Anderson, 10 South LaSalle Street, Chicago, Ill.

JANUARY 6-9.—CHICAGO, ILL.
American Road Builders' Association. Annual convention and Road Show. Secretary, Ethel A. Birchland, 37 West 39th Street, New York, N. Y.

THE FIRE HAD HIM "LICKED"

REMEMBER the old timer who used to bewail the fact that the fire "had him licked before he got there?" Those were the days when fire-fighting was more luck than science, and nine times out of ten it was faulty equipment rather than the fire itself that did the "licking".

You don't hear that expression often now. Science in the manufacture of equipment has reduced the cause.

Goodrich Fire Hose is always ready when you come "rolling in." You know that its perfectly woven jacket insures uniform strength in every foot, and there is absolute safety in the long-lived rubber of its tube.

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News and Illustrations

Items of Interest to City, Town and County Officials, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

The Refractor in the Columbus Street-Lighting Demonstration

By T. W. Rolph

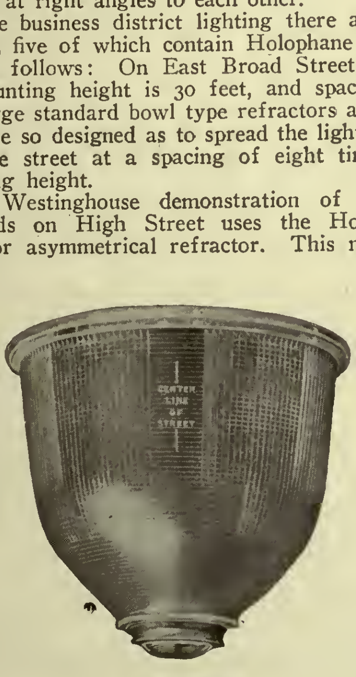
Managing Engineer, Street Lighting Department, Holophane Glass Company

THE part played by refractors in the various portions of the Columbus Street-Lighting Demonstration described in full in THE AMERICAN CITY, May, 1924, pages 478-481, is of interest. In the Columbus exhibit, three types of refractors are used, the bowl refractor, the dome refractor, and the Bilux refractor.

A street-lighting lamp not equipped with a refractor sends its light in all directions. One-half of the light goes upward, one-half goes downward, and it is equally distributed in other directions. Lamps may be equipped with diffusing glassware or redirecting glassware, known as refractors. By means of refractors light may be manipulated or redirected as desired. A portion of the upward light may be turned downward, and a portion of the downward light directed to a plane nearer the horizontal. Light can be taken from in front of the lamp and directed up the street where it is needed, or it may be directed chiefly in two directions or four directions at right angles to each other.

In the business district lighting there are nine exhibits, five of which contain Holophane refractors, as follows: On East Broad Street, where the mounting height is 30 feet, and spacing 245 feet, large standard bowl type refractors are used. They are so designed as to spread the light evenly over the street at a spacing of eight times the mounting height.

The Westinghouse demonstration of Duplex standards on High Street uses the Holophane Bilux or asymmetrical refractor. This not only turns a large part of the upward light downward, but it also turns out onto the street light which would otherwise be excessive toward the buildings. The refractor is surrounded by a globe which diffuses the light slightly.



4-WAY TYPE

The Westinghouse single-light standards on High Street extending north from Long Street are also equipped with Bilux refractors. These units have the same characteristics as those on the Duplex or twin-light standards.

DOME REFRACTOR

One block of the General Electric demonstration on Front Street is equipped with dome refractors. This refractor is also surrounded by a globe which slightly diffuses the light. The dome refractor spreads the light out widely over the street, allows a considerable degree of light close to the lighting standard and sends upward a portion of the light for illuminating the buildings.

The Westinghouse exhibit on Third Street, north of Broad, consists of lantern type units containing the Bilux refractor. This refractor when used in a lantern type unit has characteristics similar to the units on High Street, which are equipped with Bilux refractors.

Of the nine thoroughfare and residence district lighting exhibits, six contain Holophane refractors. A thoroughfare-lighting exhibit of the Westinghouse Company on Neil Avenue is equipped with the same large type bowl refractors as used in the East Broad Street demonstration. A General Electric exhibit on Neil Avenue uses standards at one side of the street and has units equipped with dome type refractors surrounded by rippled glass globes. This is the same type of refractor as used on Front Street.

The Westinghouse exhibit of residence district lighting on Dennison Avenue, using units mounted

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No excess weight to eat up gas and wear out tires. Every inch a reliable Federal—*plus* a motor famous all over the world for power, economy and long life.

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A SPEEDY BUSINESS TRUCK

BILUX REFRACTOR

at the side of the street, is equipped with the Holophane Superlux refractor. This refractor is of the bowl type but does not spread the light to quite such a great distance over the street as the larger bowl type used on East Broad Street.

The General Electric exhibit on Dennison Avenue has Holophane General Electric bowl type refractors. These refractors do not spread the light to quite the same distance over the street as the large bowl type, but allow more light to reach the street close to the standards.

Both the Westinghouse and the General Electric companies have submitted demonstrations of residence street lighting on Dennison Avenue, using the 2-Way refractor. The 2-Way refractor and its companion, the 4-Way refractor, mounted approximately 25 feet high at spacings of 12 times the mounting height, give as efficient resi- axle which passes under the transmission case and tain at the moderate expenditures which are ordinarily available for lighting such streets.

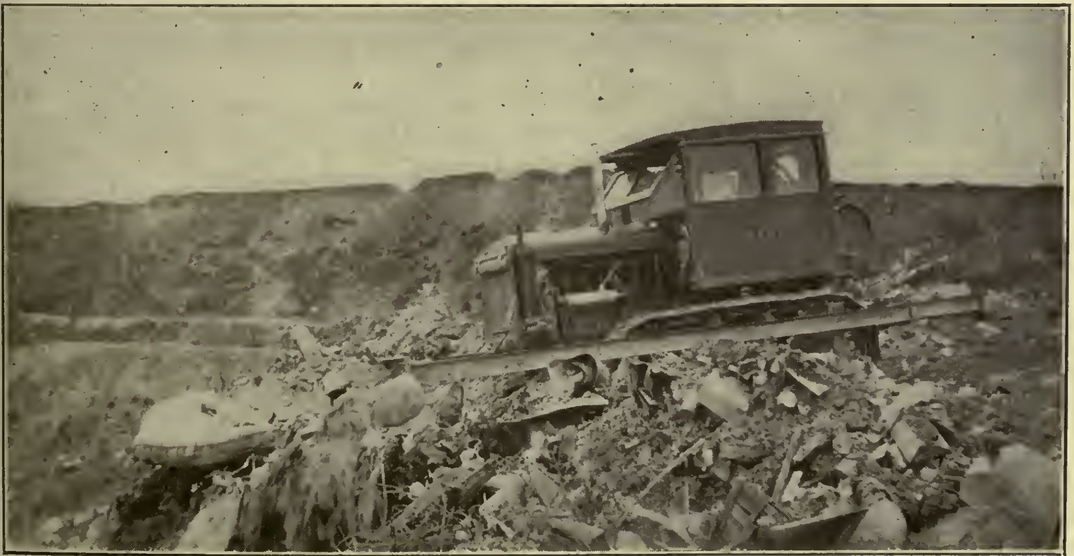
The use of refractors is quite general in modern street lighting installations, as through their use the designing engineer can cleverly manipulate the light, directing it in the desired directions with little loss.

A Back-Filler Attachment for Heavy Tractors

The handling of loose material quickly and effectively has been materially expedited by the development of the LaPlant-Choate Bull-Dozer or trench back-filler which will take the place of hand shoveling in leveling off the loose heaps of material at city dumps, and as an outfit for sewer and drainage contractors for re-filling trenches. Money usually spent for labor in doing this class of work will soon pay for one of these outfits and the contractor or municipality will be the owner of the outfit after the work is done. With this strong machine, water conditions do not make much difference, as, when attached to Holt, Monarch or Best tractors, it can handle even frozen material.

The LaPlant-Choate Manufacturing Company, 3015 First Avenue, Cedar Rapids, Iowa, has tried out many different devices prior to placing this one on the market. This Bull-Dozer is the result of accumulated knowledge with tractor plows and experience gained in the field. The Bull-Dozer is built to extend out far enough in front of the tractor to allow the tractor to stay on firm ground so that the blade will hang out over the edge of a deep fill and not get the tractor in the soft material. The single blade is hinged at the top so that in reversing it will be raised and will slide back without dragging any material with it. Furthermore, the blade is equipped with two steel runners on the reverse side to help it slide back.

The main frame of the Bull-Dozer is made up of two 5-inch I-beams, 16 feet long, strongly reinforced in front with two cross braces, and tied in the rear with two 5-inch I-beams which are quickly removed by means of four pins. The pivot bearings are bolted to the swing frame of the tractor and on the under side of the main plow frame. This bearing supports an off-set axle which passes under the transmission case and thence to the opposite side through bearing on the opposite side of the main frame. This method of



LEVELING A DUMP WITH A "BULL-DOZER"

You Can Have Good Roads the Year Round

THIS is the last warning before winter comes—it means much to your community if you heed it. Put your roads in good condition NOW! As but little time is left in which to do this necessary work, we urge you to act promptly.

Most of the winter and spring damage to roads is due either to poor drainage or poor surfacing. In either instance the damage is done by the water which penetrates into the road and freezes. When the spring thaws come, particularly when freezing and thawing alternate several times, the wheels of traffic soon cut deep into the road and it becomes impassable, or nearly so.

It is safe to say that for every dollar spent now in the needed protection of a road, you are eliminating the necessity of spending two dollars in the spring or summer—and you'll have good roads in spring when you need them.

Any defect which may exist in your asphalt roads should be corrected now, and macadam, gravel and dirt roads should be protected now by applying the proper grade of

Ask for this free booklet.

Standard Asphalt Road Oil

These oils, properly applied, will form a protective covering which will do much to keep them good throughout the year, particularly through the spring, when so many unprotected roads become impassable. Remember, please, that the recommendations and advise of the engineers in our asphalt department are always available. They will be glad to co-operate with you on any road problems—and their years of study and practical experience make their suggestions well worth while.

It would be a mistake to delay.
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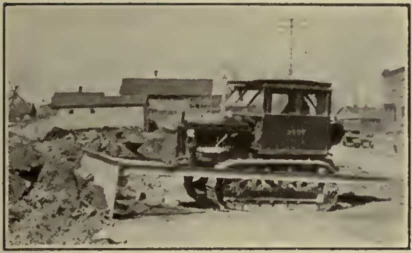


THE "BULL-DOZER" BACKFILLING

suspension is balanced by putting on rocks and sand-bags on the rear of the cross-bar deck to equalize the overhanging weight of the blade. The frame is guided from the track of the tractor by means of a vertical guide attached to each side of the rear end of the tractor swing frame.

The blade is elevated by means of a worm-geared hoisting drum attached to the rear draw-bar of the tractor by an angle-iron upright. The cable is attached to the winding drum, thence through a pulley and then up to the rear cross-tie of the main frame. A flexible coupling with the shaft attached to a 16-inch hand-wheel on the upper end is attached to the winding drum. The hand-wheel is at the rear of the cab so that the driver can easily raise or lower the blade from the cab. The push blade itself is a steel blade, ¼-inch by 3 feet by 8 feet. The blade is perfectly straight, and is heavily reinforced with ⅜ x 3 x 4-inch angle irons at the top and bottom. The lower angle is reinforced with a truss rod and turnbuckle. The upper end of the blade is attached to the main frame by means of a hinged joint attached to the opposite side of the main frame beam. This allows the push blade to swing free in reversing. When the tractor reverses the push blade is automatically raised and is supported by two curved running shoes attached to the rear-side and reinforced by a brace on the under-side of the main frame. The lower face of the curved runner has a renewable ⅝ x 3-inch halfsole. The ⅝ x 3-inch iron braces on the main frame just back of the curved runner lock the blade firmly in place when the plow is in action. The curved runners give approximately a 6-inch clearance of the blade from the ground in reversing so that the blade does not drag material back with it. The lower edge of the Bull-Dozer blade is fitted with a carbon-steel grader cutting-blade bolted to the Bull-Dozer blade, and can be removed for sharpening.

Water-tight Asphalt Joints for Concrete Sewer Pipe

According to reports received from the Barber Asphalt Company, Land Title Building, Philadelphia, Pa., engineers who have been experimenting with various materials for making pipe joints in concrete or terra cotta sewer pipes have found that asphalt makes a very good joint for dry, shifting ground, wet trench conditions, and where unstable or quicksand conditions exist. At one time portland cement was used almost exclusively for making joints in sewer pipes. Recent investigations have shown that while this material makes a water-tight joint under normal conditions, the concrete is liable to crack, causing openings at the joints when the sewer pipes are subjected to the least settlement. An asphalt pipe joint is flexible and will remain tight in spite of a settlement in the sewer pipe, with the result that the infiltration of ground water into sewers during wet seasons is prevented. Water-tight joints also prevent fine roots of trees from penetrating and forcing their way into sewer pipes, thus clogging the line.

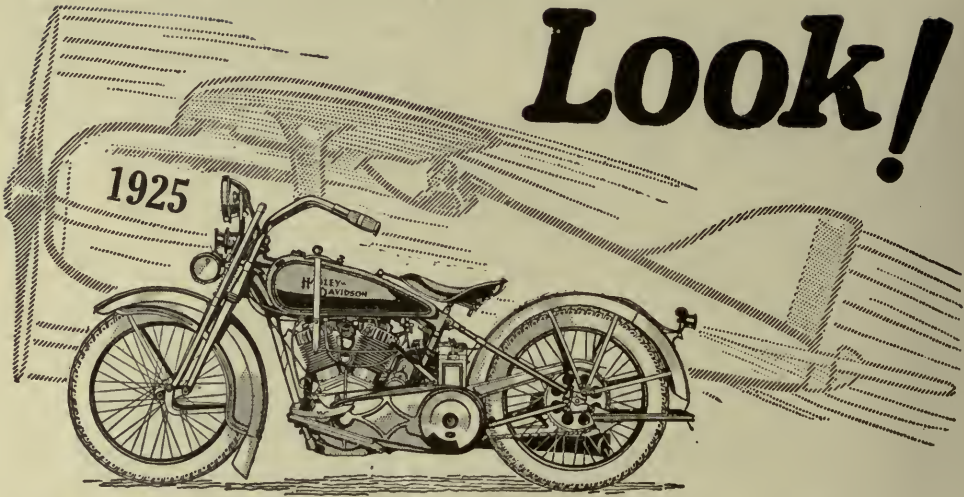
Genasco Pipe Joint Asphalt, made by the Barber Asphalt Company, has been used for a number of years for making water-tight joints in concrete and terra cotta sewer pipes. This material is said not to be affected by water, salts, acids, sewage or the usual constituents of soils. The pipe joint may be made easily and rapidly with this material. When using it the joints are first caulked with hemp or jute, after which the asphalt, which has been heated to 400 degrees, is poured into the joints to be moulded into place by the use of forms or runners. The material cools in about 15 minutes and then the runners and forms may be removed and used elsewhere. Only sufficient caulking is necessary to hold the sections of the pipe rigidly in line while pouring the pipe joint asphalt and to prevent the filler from flowing through the joint.

A UNIQUE TEST OF AN ASPHALTIC SEWER PIPE JOINT

Replogle Purchases Warren Foundry and Pipe Company

The Warren Foundry and Pipe Company, 11 Broadway, New York City, and 201 Devonshire Street, Boston, Mass., with its foundry at Phillipsburg, N. J., has recently been purchased by the Replogle Steel Company, but will be operated under the same name and in the same manner as heretofore. The sales organization will be under the same supervision and management as formerly: J. H. Morrison, General Sales Manager, in entire charge of sales with offices located at 11 Broadway, New York City, and M. L. Northrop, New England representative with offices at 201 Devonshire Street, Boston, Mass.

Look!



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SPEED in every line—strength in every curve—low-hung for safety and easy control—better-sprung and bigger-tired for luxurious comfort—that's Harley-Davidson's latest and greatest motorcycle, the "Stream-Line!"

Never a Police Mount like this before—so powerful, so speedy, so perfectly balanced, so roadworthy. From every standpoint of performance, good looks, and economy, the "Stream-Line" sets a new standard. *And yet the price is reduced!*

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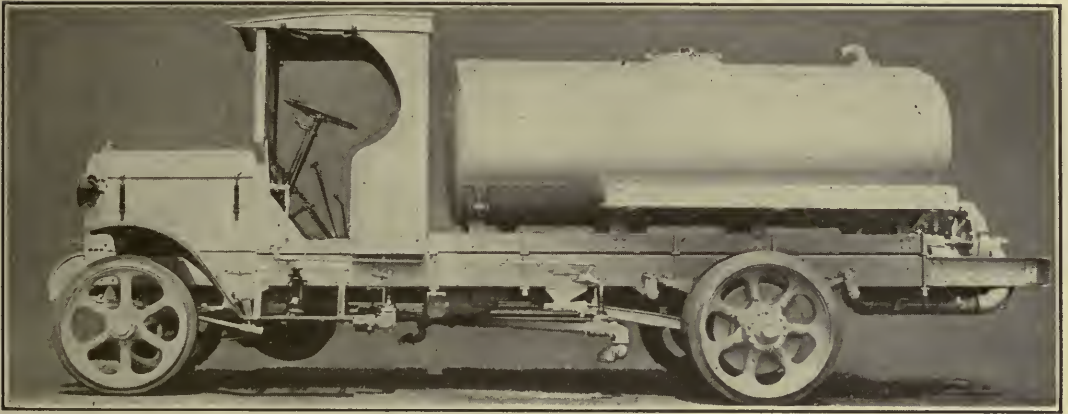

THE NEW GMC POWER FLUSHER

A New Street Flusher

A new 1,500-gallon capacity single-unit flusher, which embodies several new features, has recently been brought out by the General Motors Truck Company, Pontiac, Mich. The flusher has a single-unit power-plant, as distinguished from the dual-unit type commonly used. The dual-unit power-plant requires an extra engine, which is ordinarily mounted between the cab and the tank, and which is used solely to develop power for the water pump. The use of two engines automatically increases the operating and maintenance expense and adds to the first cost of the equipment.

In cases where flusher units have been built, in the past, with only one power-plant, the pump has been mounted between the cab and the tank, which makes necessary a long wheel-base and brings about poor load distribution because the heavy tank with its load of water must be pushed back on the chassis to make room for the pump. The new GMC single-unit flusher has changed this arrangement, and instead of pumps being placed in the usual location, the tank has been placed close up to the cab and the pump has been attached to the rear end cross-member of the frame. A rigid, heavy protection has been built around the pump to act as a bumper. This makes the pump very accessible and gives a much better load distribution on the chassis. The pump is driven from a power-take-off (an auxiliary gear-box) mounted on top of the transmission. This position makes the power-take-off also very accessible. The power-take-off gear ratio is 1 to 1, which means that the pump drive-shaft runs at engine speed. A straight line drive from the power-take-off to the pump is provided by a two-piece shaft with three universal joints. It is supported near the center by a self-aligning ball bearing, so that it is not affected by any frame distortion due to operation over uneven streets.

The tank is elliptical in section, being 74 inches wide, 46½ inches deep, and 130 inches long. It is made of No. 7 gage sheet steel and has welded joints. Two swash-plates are riveted in position. The water intake for filling the tank is located at the rear end and has a swivel connection for the filling hose. A tubular strainer is connected to the intake on the inside of the tank, and can be flushed out simply by removing a cap on the bottom of the tank. This is very handy and much quicker to manipulate than to remove, clean and replace a strainer on the top of the tank.

Both sprinkler and flusher connections are used. Either may be had without the other, but it works out economically to have both. A hard, crusted pavement surface will not readily respond to flushing. This same surface can be sprinkled and then a few minutes later flushed with perfect results. The nozzles are placed "amidships," in accordance with up-to-date practice. They are adjustable so that they will throw the water in the same or opposite directions, depending on the width of the street.

The K series motor and two-range transmission make the GMC chassis well adapted for street flusher use with the single-unit power-plant. The large range of speeds makes possible a flexibility of operation, depending upon the conditions of the street surface that promotes economy in both water and time. If a street is particularly bad, a sufficiently slow speed of travel can be used to make possible a finished job by going over it once. On the other hand, there are the higher speeds for streets that are in better condition.

The tank and pump are "South Bend," manufactured by the Municipal Supply Company. The equipment is mounted complete on a GMC chassis at its factory, although the chassis is not a standard job. The pump propeller shaft arrangement and pump mounting were developed by engineers of the General Motors Truck Company.

A Rescue Device for Skating-Ponds

A simple, safe and effective device for rescuing youngsters who have broken through thin ice on skating-ponds is being manufactured by the Playground Equipment Company, 225 Fifth Avenue, New York City. Altogether too many times do we see in the paper that some boy has fallen through the ice, and other boys try to pull him out by crawling to the edge of the hole, only to have the ice crumble under them, causing a number of drowning accidents instead of the loss of one life.

With this new device, which is a long lever mounted at its center on runners with a 4-foot ladder suspended at one end, it is possible for any one to very easily rescue those who have fallen through a hole in the ice and to remain at a point of perfect safety himself. The device is pushed toward the hole until the ladder can be caught by the youngster who has fallen in. By pressure at the other end of the lever he is lifted and then

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RESCUING A LAD FROM DROWNING IN A SKATING-POND

swung out to a point of safety. This is a device which it is well to have on any skating-pond where the water is more than 3 feet deep, and should be installed by the city playground department or an interested civic organization.

A Double-Duty Traffic Signal Lantern

A new light-weight double-duty traffic signal lantern known as "Young Sol" has been placed on the market by The Nichols-Lintern Company, 7960 Lorain Avenue, Cleveland, Ohio. The particular feature of this lantern is that it gives a long-vision warning from the upper portion of the lantern, while the lower portion gives a brilliant ground illumination at such points as street intersections, railway crossings, interurban car stops, bad curves, bridge abutments and other similar points where both warning lights and ground illumination are essential.

The 4¾-inch Corning Fresnel lens which gives the long-distance warning is made either in ruby, green, yellow or clear glass. The highly polished aluminum reflector, which is 16 inches in diameter, furnishes the ground illumination, one electric light bulb supplying the light for both the lens and the reflector. Equipped with a Mogul base receptacle and an Edison base adapter, it is suitable for a 100-, 200-, 300- or 500-watt lamp. The complete unit is only 13¼ inches high and the cast aluminum construction assures a long life with freedom from rust, dents and acid corrosion. The lantern is furnished with a span wire hanger or for ¾-inch pipe suspension.

A COMBINED WARNING SIGNAL AND FLOOD LIGHT

An Electric Siren for Traffic Control

Present-day traffic conditions demand a dependable siren at busy street intersections if fire apparatus is to pass with safety. The clear tone of a siren means "Fire trucks coming," and there is no other road signal made which secures road clearance and eliminates danger of traffic accidents as quickly.

The Sterling electric traffic siren made by the Inter-State Machine Products Company, Inc., 53 Allen Street, Rochester, N. Y., is claimed to be positively weather-proof and can be installed very quickly. This Type "F" siren is operated by a ⅛-h.p. motor, the bearings of which are lubricated by two accessible oil cups. The motor is enclosed in a substantial housing fitted with a condulet connection so that all wiring may be done in the most approved manner, leaving no exposed wires.

A SIREN TO WARN TRAFFIC

The Sterling siren can be operated from an ordinary snap switch, as the running load is only 2½ amperes on a 110-volt circuit, or it can be controlled from fire headquarters or any firehouse by use of a siren control box and relay. The box will operate the siren automatically for a period of three minutes at intervals of three seconds on and three seconds off, giving traffic plenty of time to make way for the approaching fire apparatus. The siren measures 9 x 14 inches, weighs 14 pounds and is finished in heavy red enamel.

Heed, Vice-President of Garford

The Garford Motor Truck Company, Lima, Ohio, has announced the appointment of Rushmore B. Heed as Vice-President in charge of sales. Mr. Heed has been active in the motor truck industry since 1916, when he left the automobile insurance field to join the sales force of the Diamond T. Mr. Heed's headquarters will be at the Garford factory in Lima.

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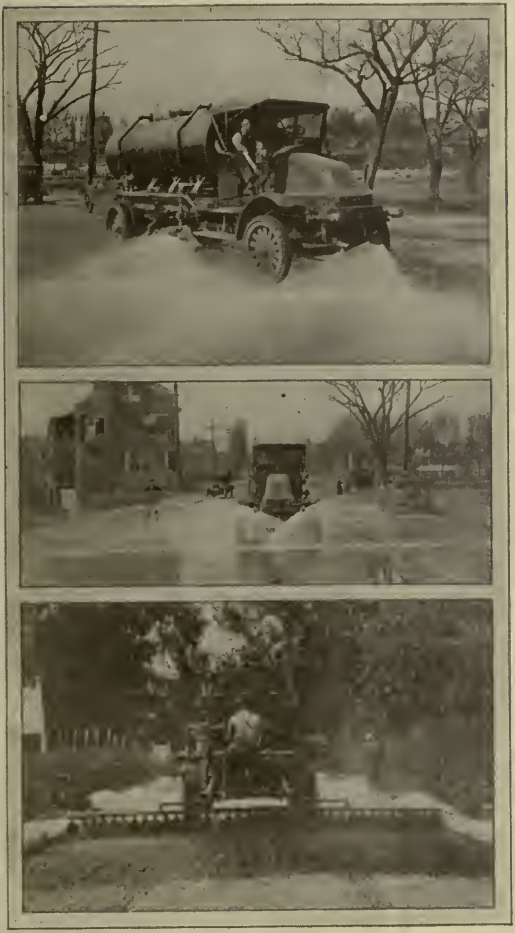


THREE VIEWS OF THE COMBINED FLUSHER, SPRINKLER AND ROAD OILER

A Combination Auto Street Flusher, Sprinkler and Road Oiler

The latest development in pressure distributors for municipal street departments is the Kinney combination auto street flusher, sprinkler and road oiler made by the Kinney Manufacturing Company, Boston, Mass. The flusher and sprinkler has a single power-plant for both truck and pump drive. This power is amply sufficient for all requirements when flushing under any pressure. It eliminates the necessity for an extra gasoline engine or other separate power unit for supplying pressure, and only one man is required for driving the truck and for flushing and sprinkling.

The pressure is constant and continuous throughout the discharge of the entire load of water and may be instantly varied to any angle as required by the operator. The tank may be filled from stand-pipes or hydrants. Since the pressure is produced entirely by the pump, there is no pressure in the tank and no compressed air is used, the water being pumped direct to the nozzles in any desired volume.

The Kinney flusher and sprinkler may be equipped with Kinney oil-spraying attachments, which are located at the rear end of the chassis and are used for spraying the lighter grades of road oil or tar products in an atomized spray of required volume and pressure. The change from water sprinkling or flushing to oil spraying is made instantaneously by simply turning a valve without the removal of any attachments. The oil-spraying attachments are controlled from the operator's seat at the rear of the tank or from the driver's seat. This oil-spraying equipment is designed only to handle the light grades of bituminous materials which do not require heating. The equipment is self-loading from tank cars or storage tanks.

A Safety Climbing Tree for Playgrounds

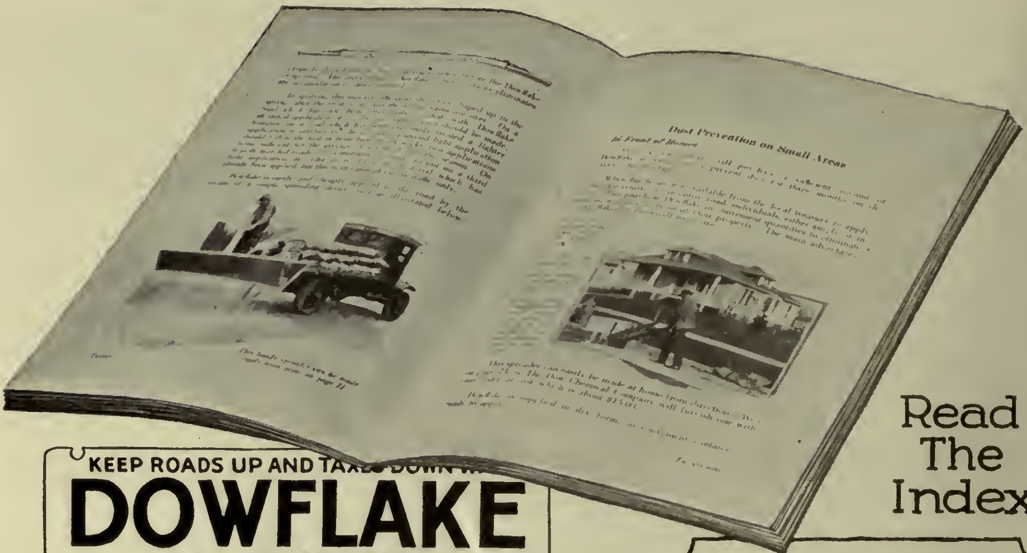
All children like to climb, but city children cannot always find a safe apple tree near-by to give vent to this inborn desire. A safety climbing tree is made by The Patterson-Williams Manufacturing Company, 501-507 West San Fernando Street, San Jose, Calif., which keeps youngsters out of unsafe trees and off fences and prevents the tearing of clothes and keeps them clean.

CLIMBING A SAFE TREE

This tree, illustrated above, is especially adapted for school playgrounds, for children of the kindergarten, first and second grades, as it provides splendid amusement and plenty of exercise. The children use it in a hundred different ways with perfect safety. It is built up of ¾ x 42-inch galvanized pipe with protecting guard-rails at the end to prevent injury. The cross-pipes are welded into 2-inch galvanized pipe standards 7 feet high.

A "V" Type Snow-Plow for Motor Trucks

The Baker "V" type snow-plow for motor trucks is a two-way plow designed for attachment to standard heavy-duty trucks. The attachment is made to the front axle of the truck in the same manner as the Baker auto truck snow-plow, also made by the Baker Manufacturing Company, 503 Sanford Avenue, Springfield, Ill. This snow-



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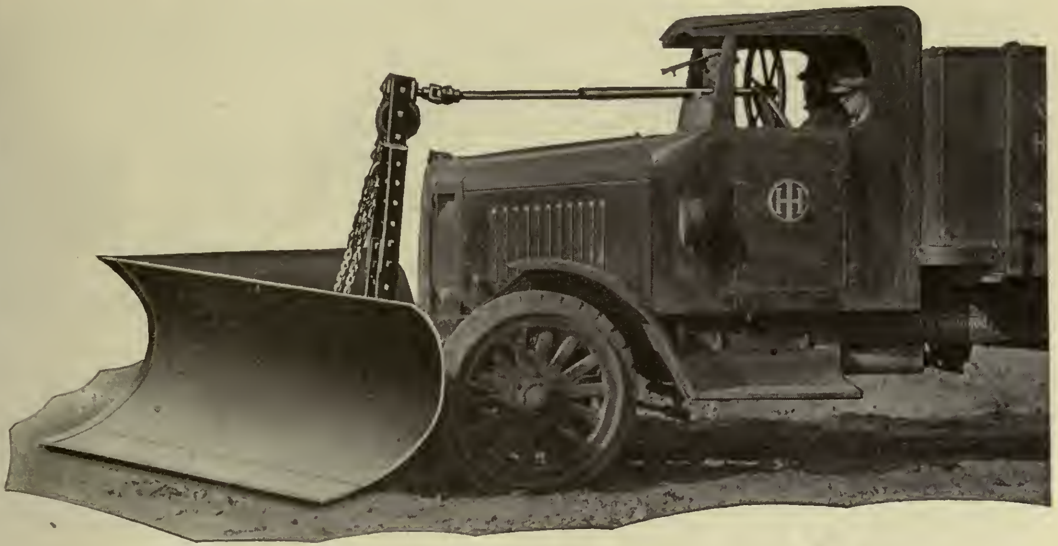

AN EFFECTIVE COMBINATION FOR REMOVING SNOW-DRIFTS FROM ROADS

plow is made to meet the demand for a practical two-way plow for use with motor trucks to suit special conditions where there is no objection to throwing the snow out both to the left and to the right.

This plow is made a standard width of 8 feet. This represents the width of roadway the plow will open in one trip. By using one side of the plow only, it is possible to move the snow a distance of 3 or 4 feet on each side, making a total width moved of 14 to 16 feet, which is sufficient to take care of ordinary traffic. The plow is braced in such a way that the moldboard or wings will withstand any pressure that the average motor truck can apply in snow removal work. The curvature of the wings is designed to offer the least possible resistance to the movement of snow in its average state.

One of the particular advantages of the "V" type snow-plow over other types is the elimination of side draft in moving the snow. This very naturally gives an opportunity for the motor truck to use its full power in moving very deep snow. The method used in moving snow with the "V" type plow differs from that of the blade type plow because the latter is reversible to move snow to either side. One method of opening up a wide road or street for prompt use by motor traffic is to clean one side of the road and then the other, leaving an accumulation of snow in the center of the road. This permits the use of two paths each 8 feet wide for travel in each direction. This assumes, however, that the road or street is of sufficient width to permit this method to be used. It is possible, however, to widen out the path made by the plow several feet wider by using one side of the plow.

The Baker "V" type plow can be attached without extras to any standard make of motor truck without drilling any holes in any part of the truck frame. This is of decided advantage when it is necessary to attach the snow-plow to another truck when the truck on the snow-plow is disabled. This would be impossible if a special frame was made for each truck, as the frame would be useless on another make of truck. There are certain trucks of unusual front end construction and certain four-wheel drive trucks for which it is necessary to construct a special attachment.

Universal axle clamps, after being placed on the motor trucks, may be left on all winter so as to be ready for attaching the snow-plow when a storm arrives. They do not interfere in any way with the operation of the trucks and it saves valuable time to keep them on at all times. It is a comparatively simple matter to attach the A-frame of the plow with only two bolts when necessary, and takes but a few moments.

Improvements in Spokane Water-Works

IMPROVEMENTS for the city water system of Spokane, Wash., to be built during 1925, total more than $460,000, according to the budget compiled by Superintendent A. Lindsay and forwarded to the city auditor. Two of the group items are new cast-iron mains to replace some wooden mains in use on the north side of the city at a cost of $175,000, and new electric pumps to be housed in an addition to the pumping plant and one new well, at a combined cost of $165,000. Fifty million gallons will be added to the daily pumping capacity of the water-works by the proposed unit as compared with 86,000,000 gallons per day capacity at present. The third large item is the building of a new reservoir east of the city at a cost of $120,000.

This is the largest program of water-works improvements proposed to be undertaken in Spokane since 1909. The improvements will be financed from the funds of the Water Department, which is self-supporting, and will not be reflected in the tax levy.

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NOVEMBER
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Parkways for Pleasure and Utility

A TIMELY plea for correlation of effort between park departments and city planners in the development of parkways and boulevards was made at the annual meeting of the American Institute of Park Executives, in Washington, October 7, by Thomas H. MacDonald, Chief of the United States Bureau of Public Roads. Emphasizing the fact that the achievement of beauty and utility in the same object is a worth-while accomplishment, Mr. MacDonald urged that more consideration than heretofore be given to the relation of the roads of park systems to the problem of traffic relief. To quote:

"Existing, projected or possible parkways, including roadways within park areas and connecting drives or boulevards, can no longer be regarded or treated separately from the general traffic scheme. The public have seen certain relief from traffic-congested streets and are making use of these roadways 'to get somewhere,' quite aside from the recreational uses of these same roadways. This serving of a strictly utilitarian purpose may invade violently some of the premises upon which parks and their ways have been established. It undoubtedly is causing consternation to many a park administrator. But there is another and very much more encouraging aspect. We are entering a period of park development on a scale imagined only by bold thinkers who recognize the principles which existing conditions are setting in motion. A number of big-visioned parkway developments have progressed to a point where their utility as efficient fast traffic lines is already apparent. These exist both within the most congested metropolitan areas and outside in country areas where only local roads have heretofore run.

"The laying out of state systems and the Federal aid system of highways has joined all of the larger cities and towns by a network of more than 170,000 miles of major rural highways. At the boundary lines of the municipalities the increasing traffic over these roads is dumped upon the city streets. It is a miscellaneous assortment of vehicles which varies between wide limits in size, speed and service. Under the present plan, quite generally this traffic as a whole continues into the towns and cities along the established traffic lanes, which lead right into the heart of the business districts. This traffic is met, joined and crossed by the cosmopolitan assortment of traffic found on any city street on a busy day. The effect on the whole is to slow up and prevent the functioning of the streets at any reasonable percentage of their actual capacity, and so we have the problem of congestion rapidly growing.

"The only way traffic congestion will ever be solved is to make it easy to avoid congestion and difficult to have congestion. The human nature behind the wheel will follow the easy way. Add to this the tremendous discharge capacity of a wide roadway which has no intersections at grade or too restrictive speed limitations. Add the established principle that, generally speaking, traffic congestion is limited to peak periods each day of relatively limited duration. Add the common-sense plan of sorting out the fast-moving pas-

Through Streets for Traffic Relief

At another October convention—the National Safety Congress, in Louisville, Ky.—the importance of creating through streets was strongly urged. On this subject Morris Knowles, Chairman of the City Planning Commission of Pittsburgh, Pa., said:

"Traffic counts in various large cities have shown that the through traffic, using the busiest streets in traversing the city but having no business to transact, amounts to something like 20 to 25 per cent of the total. Even after through streets have been established, it is important that they be properly marked and made known to the motoring public.

"It has been found in certain instances that congestion has become so pronounced that motorists passing through would travel a considerable distance in going around the congested area, not only because the conditions of travel are more pleasant, but because there is an actual saving in time."

senger traffic, which composes by far the greatest percentage of all traffic, and the sum total equals the establishment of parkways and boulevards leading from the centers of urban areas into the suburban and rural districts over roadways that have few and preferably no intersections at grade, are wide, and parked in keeping with the general scheme of the beautification of the city.

"In addition to such radial roads, there must necessarily be the development of outer belt lines or concentric roads, partially for the purpose of detouring traffic from outside into those sections of the city which it desires to reach, and partly for the purpose of carrying traffic entirely around the congested centers rather than through the business districts.

"These are the two outstanding types of development which are needed within the congested areas, and they may very logically be made a part of the park plan of the city.

"Here the engineer and the architect have a common work, that is, the achievement of beauty and utility in the same object. For example, the problem of avoiding interesections at grade by separating the roadways by over or under crossings may be worked out to add to the scenic value, or be commonplace and most unattractive.

"It may be urged that this advocates a large expenditure of funds. It is true. But it is equally true that such expenditures in the end will be real economy, because of relief of traffic congestion, which is only another term for great loss of time; plus safety to traffic, the absence of which is now causing so much concern to every municipality. That such expenditures are sane and worth-while will be evidenced by traffic relief, by the added utility of the motor vehicle, by better living conditions in the suburban areas, by the beautification of the cities and towns, etc.

"There will be an additional evidence which is fundamental, that is, the change in property values. We have adopted an entirely new system of transport. The effect of converting property values from higher to lower or lower to higher is only beginning. Properly handled, such improvements as here suggested will be offset many times by the increased property values, and if they are not made their cost will be many times lost by the decreased earning capacity of property now considered highly valuable."

In the discussion which followed Mr. MacDonald's paper at the Washington convention, emphasis was given to the value of parkways as a means of by-passing through traffic at a considerable saving of time over a more direct route through congested streets. In this connection it was recommended by Jay Downer, Chief Engineer of the Westchester County (N. Y.) Park Commission, that all new through traffic parkways should have two separate roadways, one for fast-moving automobiles and one for slow traffic. Freedom from bad grade crossings and compelling all cross-traffic to come to a full stop at through parkways or boulevards were also emphasized as important requirements.

City Managers Adopt Code of Ethics

AT the annual convention of the International City Managers' Association, held in Montreal, September 23-25, the following Code of Ethics was adopted:

1. The position of City Manager is an important position and an honorable position, and should not be accepted unless the individual believes that he can serve the community to its advantage.

2. No man should accept a position of City Manager unless he believes in the council-manager plan of government.*

3. In personal conduct a City Manager should be exemplary, and he should display the same obedience to law that he should inculcate in others.

4. Personal aggrandizement and personal profit secured by confidential information or by misuse of public time are dishonest.

5. Loyalty to his employment recognizes that it is the council, the elected representatives of the people, who primarily determine the municipal policies and are entitled to the credit for their fulfillment.

6. Although he is a hired employee of the council, he is hired for a purpose—to exercise his own judgment as an executive in accomplishing the policies formulated by the council, and to attain success in his employment he must decline to submit to dictation in matters for which the responsibility is solely his.

7. Power justifies responsibility, and responsibility demands power, and a City Manager who becomes impotent to inspire support should resign.

8. The City Manager is the administrator for all the people, and in performing his duty he should serve without discrimination.

9. To serve the public well, a City Manager should strive to keep the community informed of the plans and purposes of the administration, remembering that healthy publicity and criticism are an aid to the success of any democracy.

10. A City Manager should deal frankly with the council as a unit and not secretly with its individual members, and, similarly, should foster a spirit of cooperation between all employees of the city's organization.

11. No matter how small the governmental unit under his management, a City Manager should recognize his relation to the larger political subdivisions and encourage improved administrative methods for all.

12. No City Manager should take an active part in politics.

13. A City Manager will be known by his works, many of which may outlast him; and, regardless of personal popularity or unpopularity, he should not curry favor or temporize, but should in a far-sighted way aim to benefit the community of to-day and of posterity.

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*NOTE.—The phrase "council-manager government" means that form of municipal government in which the people choose a legislative body, be it called a Council, a Commission or a Board of Directors or something else, which employs a City Manager to exercise the administrative and executive functions of the city.

Tractive Resistance and Characteristics of Roadway Surfaces

Abstracted from the Report of T. R. Agg, Professor of Highway Engineering, Iowa State College, Ames, Iowa

IN 1922 the Iowa Engineering Experiment Station published the report of a preliminary investigation of rolling resistance and other resistances to the translation of motor vehicles. That preliminary report indicated the desirability of a comprehensive investigation of the subject, so a cooperative investigation was inaugurated in which the Iowa Engineering Experiment Station, the United States Bureau of Public Roads, and the Iowa Highway Commission were participating. This investigation correlated with the program of highway research recommended by the Advisory Board on Highway Research of the Division of Engineering of the National Research Council.

Digest of Results of the Investigation

The quantity commonly referred to as the tractive resistance of self-propelled vehicles includes several groups of more or less independent resistance to the movement of the vehicle. Each elementary resistance has some significance, either to the highway engineer or to the automotive engineer. Of these various groups of resistances, the one most significant to the highway engineer is that resulting from the interaction of the tire and roadway surface, including the impact effects on translation set up thereby. These effects reduced to an equivalent force applied at the axle of the vehicle, constitute the quantity known as rolling resistance, which is usually expressed in pounds per ton of weight of the vehicle. It is impracticable to measure rolling resistance without including the resistance of still air to the passage of the vehicle, and for that reason most of the values obtained for tractive resistance are really values for rolling plus air resistance. For most economic studies it is desirable to use the quantity, rolling plus air resistance, since this represents the ordinary minimum resistance to the translation of the vehicle.

Rolling resistance is not a constant quantity but on the contrary varies between rather wide limits, as is the case with many fundamental quantities that the engineer must use. From the very nature of the application of rolling resistance it would be a waste of energy to attempt to determine its magnitude with a high degree of precision. The results secured are probably within 5 per cent of the true values, which is believed to represent as high a degree of precision as is warranted.

Rolling resistance apparently varies: (1) with the roughness of the roadway surface; (2) with the degree of rigidity of the roadway surface; (3) with the type of tire (for solid rubber tires it is higher than for pneumatic tires); (4) with the temperature of the tire and with the temperature of the roadway surface, if of a bituminous type; (5) with the physical texture of the roadway surface; (6) with the gross weight carried by the tires.

Effect of Tire Temperature on Rolling Resistance

The temperature of the tire rises slowly when a vehicle is put into operation, but finally reaches a temperature at which the heat is dissipated as rapidly as generated and the tire temperature ceases to rise. The maximum temperature reached will vary with the air temperature as well as with the usage. This results in a seasonal variation in rolling resistance which in the case of solid tires may reach a very material percentage of the total rolling resistance, but is less marked in the case of pneumatic tires.

Effect of Roughness of Roadway Surface on Rolling Resistance

It was discovered early in the investigation that there was an increase in the rolling resistance accompanying an increase in the roughness of the roadway surface, and many attempts were made to determine the exact degree of roughness that has a measurable effect on rolling resistance. This was attacked at first by measuring the amount of vertical travel due to unevenness of pavement and attempting to compute vertical accelerations and consequent loss of energy. For this work a pantagraph was designed for plotting to a magnified scale the profile along which the wheel had moved. It consisted of a small roller at the lower end of a vertical bar which is a part of an ordinary pantagraph system.

The whole mechanism is carried on a small truck with flanged wheels. The track consists of 3-inch I-beams at each end of which are leveling screws. The track is set up and adjusted for height and the carriage drawn along with the roller, following the marked path of the wheels of the truck. Many attempts were made to establish some fixed relation between the rolling resistance of the surface and the profile of the surface, but without success. It was readily shown that for a given vehicle and type of road or surface the resistance increased with the roughness of the surface. Speed and the suspension system of the vehicle as well as the degree of rigidity of the road surface and the nature of the unevenness all enter into the problem.

Relation Between Type of Tire and Rolling Resistance

The investigation has shown quite conclusively that under identical conditions the rolling resistance of solid tires is from 6 to 10 pounds per ton higher than for pnuematic tires. This is in line with the experience of tire users who have kept records of the relation between fuel consumption with the two types of tires. It should be observed that this relation between the rolling resistances of solid and pneumatic tires is less readily established on gravel and earth roads than on paved surfaces, because of the lack of uniformity in the low-grade surfaces.

Rolling Resistance on Snow

As might be expected, the rolling resistance on clean, dry, hard surfaces is much lower than when these surfaces are covered with snow. Likewise, the degree of compactness of the snow has a marked relation to the rolling resistance thereon. Much difficulty was experienced in determining the rolling resistance on snow on account of its great variability and the impossibility of attaining a range of speed when heavy vehicles were used. The data obtained are of greatest value in showing the economic justification for clearing the snow from busy thoroughfares. Even a thin layer of fairly well-compacted snow results in a decided increase in rolling resistance.

Effect of Temperature of Pavement on Rolling Resistance

The measurement of this quantity is complicated by the fact that tire temperatures also affect rolling resistance, but it seems to be conclusively shown that the rolling resistance of the sheet asphalt pavement increases materially with an increase in temperature, and that the rolling resistance of the coarse aggregate type of asphaltic concrete increases somewhat with an increase in temperature.

Fuel Consumption Investigations

Many problems of design involve the use of values for rolling resistance, but in certain economic comparisons it is desirable to know the effect of variations in rolling resistance upon the cost of fuel for the vehicles that use the highways. The relative fuel consumption on various classes of roadway surfaces will vary with the vehicle and the driver and perhaps with other factors related to the vehicle as well as with the rolling resistance of the roadway surface. The problem is still further complicated by the fact that the four-cylinder, throttle-governed gasoline engine increases in efficiency rather rapidly as the throttle opening increases. The power developed is therefore dependent upon operating conditions as well as fuel consumed.

In order to determine what relation existed between the rolling resistance of the road surface and the fuel consumed, a number of vehicles were operated over various types of roads in an attempt to obtain information on this point. For comparative purposes it was assumed that internal resistance in the vehicle was equal to the sum of rolling and air resistance when the vehicle was operated on good pavements.

The fuel consumption runs were made with vehicles in ordinary working condition and in charge of drivers of experience who were carefully instructed. For each vehicle a running speed was established to which they were to adhere as nearly as possible. The courses selected were devoid of grades of any consequence except when runs were made specially for the purpose of studying grade effects. Most of the individual runs covered distances of 100 miles or more, but a few 50-mile runs are included. In tests made with a heavy Aviation truck with a gross weight of 8 tons, the relative fuel consumption varied from 0.97 to 1.06 on the best gravel road to 1.33 on ordinary earth roads and 1.39 on hard, dry, smooth gravel roads. Monolithic brick and portland cement gave 1.00 each, while bitulithic pavement in best condition gave 0.94 and in August 1.33. A Dodge touring car with a gross weight of 2,800 pounds gave values from 0.95 to 1.30 on best gravel roads in various conditions; dirt roads, 1.23; concrete pavements, 1.00; and ordinary earth roads in fair condition, 1.52. A Ford touring car with a gross weight of from 1,900 to 2,200 pounds gave the following values for relative fuel consumption. Portland cement concrete, 0.85 to 1.10; good bitulithic, 0.95 to 1.03; best gravel, 0.95 to 1.03; monolithic brick, slightly rough, 1.12; best earth road, 1.03 to 1.37; gravel, 1.15 to 1.57, the latter value being for a poor road.

Filter Operation and Chemical Treatment of the Providence Water-Supply

By J. W. Bugbee
City Chemist, Providence, R. I.

CITY water was introduced into Providence more than fifty years ago, and ever since that time the supply has been taken from the Pawtuxet River at Pettaconset, about two miles above the point where the river discharges into Narragansett Bay. When this location was selected, the water was not seriously polluted, but 25 years later, owing to the increase of population on the watershed, which has an area of approximately 200 square miles, the pollution had become so great as to necessitate the employment of some method of purification.

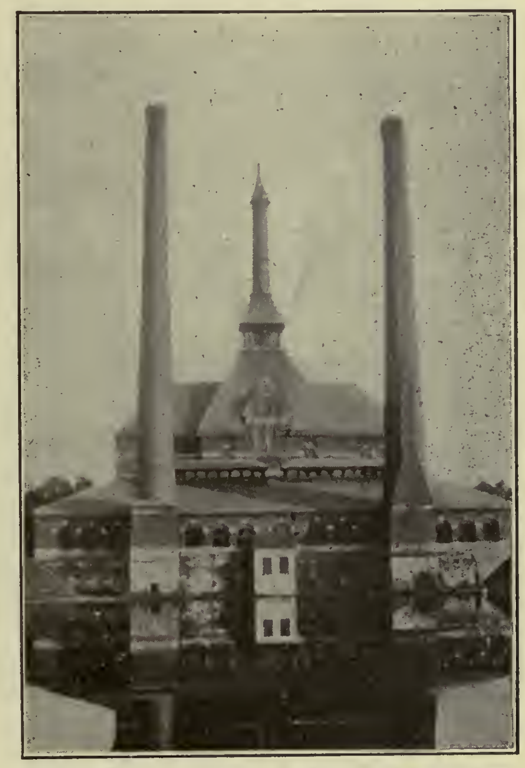
Adoption of Filtration

After a long study of the relative merits of slow sand and mechanical filters, the former were adopted, and contracts were let in May, 1902, for six open beds of one acre each. Later, four more beds were added, and all the beds were provided with covers, as the experience of the first winter's operation of the open beds had demonstrated that satisfactory results could not be obtained from them in severe weather.

While the construction of this plant apparently insured the quality of the water delivered to consumers, apprehension had always been felt regarding the quantity which could be reckoned on in periods of dry weather, since the city had no system of reservoirs above the intake to the filters and had always depended upon the mills situated above Pettaconset to let down a sufficient supply of water for the daily needs of the city.

The Scituate Supply

Because of this fact, studies of the possibility of obtaining a larger and more dependable supply were begun soon after the completion of the filters, and these studies resulted in the development of the present Scituate project,* which when completed will replace the present filters, pumping-station, and storage reservoirs. It was expected that water from this source would be available in 1922, but when it became apparent that because of war conditions the completion of this work would be considerably delayed, steps were taken to increase the capacity of the present plant.



CLEAR-WATER BASIN AND PETTACONSET PUMPING-STATION, PROVIDENCE WATER-SUPPLY

Changes in Filter Sand

The operation of the filters had always been handicapped by excessively high initial loss of head. In severe weather this had frequently been as high as 1½ feet, and as the beds cannot be operated with a loss greater than 4½ feet, the runs during the winter were necessarily very short, entailing a large amount of scraping and sand removal and increasing the out-of-service periods of the beds.

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*The details of this project were described by Chief Engineer Frank E. Winsor of the Providence Water Supply Board in an article appearing in THE AMERICAN CITY, June, 1920, page 563.

Tests made with a series of pipes extending to different depths in the sand showed a gradual increase in loss of head from top to bottom of the bed, indicating the presence of fine material through the entire body of sand. This was due to the fact that when the beds were being constructed, a sand specification was used which fixed the effective size between 0.26 and 0.34 of a millimeter, and in the interest of bacterial efficiency the finer limit was followed very closely. It was possible, therefore, to rewash the sand and permit the escape with the wash-water of sufficient fine material to bring the effective size up to the coarser limit of the specification.

This work of washing and replacement was begun in the summer of 1917, and eight of the beds were treated in this way during the next two seasons, exception being made in the case of beds 1 and 2, in which the loss-of-head tests had shown only a very slight increase from top to bottom of the bed. These two beds had also shown by actual test that they were capable of maintaining rates as high as 4 million gallons per acre per day for a considerable length of time.

In order to carry on this work economically, a system of water and sand piping was installed in the beds, and a steam-turbine-driven centrifugal pump was introduced into the main supply line leading from Sockanosset reservoir to the beds. This increased the working pressure to 110 pounds when operating three ejector-boxes and two washers.

To speed up the work still more, a large portable washer was constructed which could handle the output of two ejector-boxes, and this has proved so satisfactory that it has entirely superseded the stationary court washers formerly used.

As a result of this work, the initial loss of head has been reduced to less than ½-foot except in the very coldest weather, and the length of filter runs has been correspondingly increased without any apparent loss in efficiency.

Chlorination

The same aversion to the use of chemicals in water treatment which had been used as an argument against mechanical filters had also been felt toward chlorination, but as the operation of the filtration plant would necessarily be disturbed during the installation of the new piping system and the extraordinary sand-washing operations, a chlorinator was installed as a precaution against the accidental passage of poorly treated water. This was looked upon as a temporary expedient, to be dispensed with when the plant should have resumed normal operation, but the changes extended over so long a period that chlorination came to be considered an essential feature of the treatment, and has been carried on continuously since the installation of the apparatus.

For some time chlorine was applied at a fixed rate of 2 pounds per million gallons, but later the excess chlorine method of control was adopted, and the amount applied is so regulated as to leave an excess of 0.1 to 0.2 of a part per million after 15 minutes' contact period. The total amount required to be added to the filtered water to maintain this excess varies between 0.4 of a part and 1 part per million.

After chlorination, which takes place just before the filtered water reaches the pumps, the water is lifted to Sockanosset reservoir, passing through the reservoir before entering the mains. No excess chlorine has been detected at any time at the outlet end of the reservoir, but occasional complaints of taste and odor have been received at such times as the amount applied has exceeded 0.7 of a part per million.

The chlorination apparatus in use at present consists of two Wallace & Tiernan MDA type panels with injectors, each apparatus having a capacity of 200 pounds per day.

A noticeable feature of the action of the chlorine has been the difficulty experienced in effecting complete removal of lactose fermenting organisms. For example, with a treatment of 0.7 of a part per million, one would expect very few positive tests in 10 cubic centimeters, whereas in the first six months of the present year the chlorinated water gave 79 positive presumptives out of a total of 154 tests made. Confirmation of these tests, however, showed that of the 79 positive presumptives, 40 were due to the presence of a lactose-splitting anaerobe, while 28 were members of the colon-aerogenes group other than true B. Coli, leaving only 11 positive tests due to B. Coli of fecal origin.

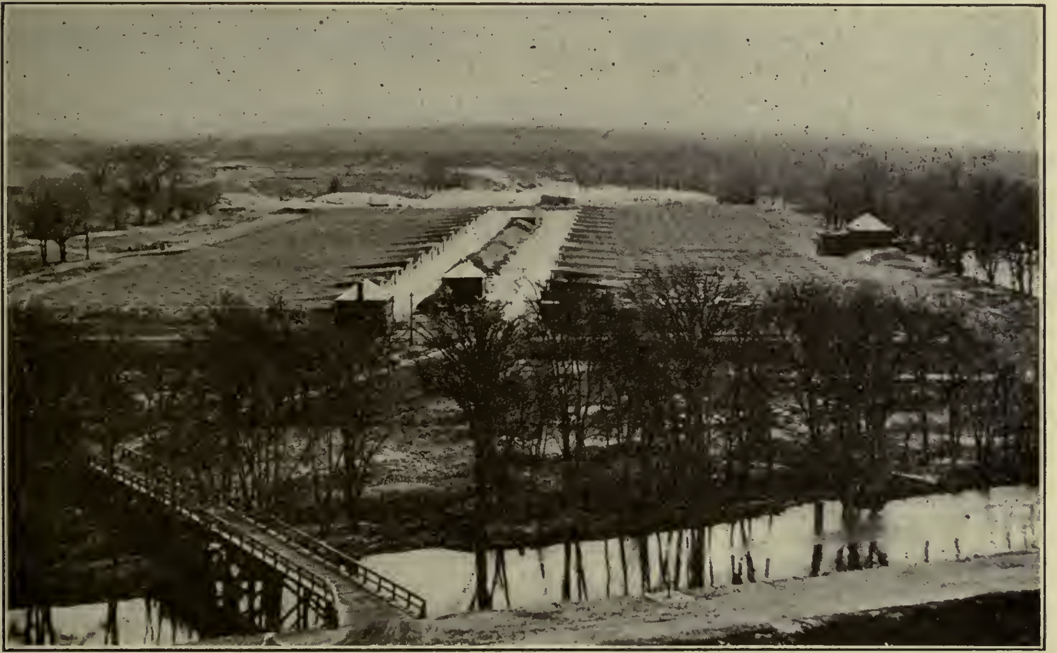
Lime Treatment

One of the most important features of the present treatment is the neutralization of free carbonic acid by the addition of hydrated lime. The decision to introduce the lime treatment was brought about by the publication in the *Journal* of the Rhode Island Medical Society for January, 1918, of an article by a prominent physician of Providence on the general subject of lead poisoning. In this article it was suggested that many cases of disease of obscure cause might be attributed to lead poisoning, and that this poisoning might be traced to the city water-supply, especially in a city like Providence, where lead is used for service pipes and for house plumbing.

Very few cases of lead poisoning had been reported in Providence, and none of these had been proved to be caused by the city water; but as the character of the filtered water indicated that it might be corrosive to lead, an investigation was decided upon, and a large number of tests were made of water from all parts of the city. These showed lead in amounts varying from 0.05 to 0.8 of a part per million, with an average amount of 0.29 of a part per million, and while this did not indicate a dangerous condition, judged by the quite generally accepted limit of 0.5 part per million, it was thought advisable to remove any possible danger by decreasing the corrosive action of the water.

The carbonic acid content of the water after leaving the filters varies at different seasons of the year between 8 and 15 parts, and it was therefore possible to neutralize all or nearly all of the free carbonic acid with lime without increasing the hardness sufficiently to render the water unsuitable for domestic or industrial use.

The lime is applied in the form of hydrate by means of a Gauntt dry feeder, driven by a water motor, the waste water from the motor serving to carry the lime into the filtered-water conduit leading from the south regulator house. This permits a contact period of about ten minutes, which apparently is sufficient for the completion of the reaction before the water reaches the basin at the pumping-station.



GENERAL VIEW OF THE PROVIDENCE, R. I., FILTRATION PLANT

The fluctuations in the amount of free carbonic acid are not rapid, and it is possible to regulate the operation of the lime treatment by daily tests, so that the free carbonic acid remaining in the water after the treatment is always between 1 and 3 parts per million. Tests for lead are made frequently in samples collected from various sections of the city, and these show that the result of the lime treatment has been an almost complete prevention of corrosive action on lead piping. Of the samples taken during the past year, the greatest amount of lead found was 0.13 of a part per million, while the average was only 0.05 of a part per million, as contrasted with a maximum of 0.8 and an average of

0.29 found before the introduction of the lime treatment.

Microorganisms

For many years the consumers using the water from Hope and Fruit Hill reservoirs had been troubled by taste and odor at certain seasons, but as the trouble had never been severe nor of long duration, nothing had been done to relieve this condition until 1918. In this year the complaints were so numerous that both reservoirs were treated with copper sulphate, which resulted in stopping all complaints immediately. The cause of the troubles having been identified as uroglena, the practice has since been followed of dosing with copper sulphate whenever the weekly microscopic examination shows that uroglena is present, even in very small nmbers. This has required only two treatments per season at the most, and in several cases a single treatment has sufficed for the entire season.

Conclusion

To sum up briefly, the present treatment consists of filtration at the rate of 2.5 million gallons per acre per day, the addition of hydrated lime in amounts varying between 50 and 100 pounds per million gallons, chlorination, using between 3 and 8 pounds per million gallons, and copper sulphate dosing for the reservoirs whenever required.

The noteworthy fact connected with these innovations which have supplemented the work of the sand filters is the gradual change in the attitude of the public in relation to the use of chemicals in water treatment. The aversion which was formerly manifest apparently does not exist at present, and this is further shown by the fact that the new Scituate supply is to be filtered through rapid sand filters, with alum, lime, and chlorine as probable features of the treatment.

Acknowledgment.—From a paper read before the New England Water Works Association at Rochester, N. Y.

Repairing a Bridge Under Heavy Traffic

Sheet Asphalt Paving on Old Concrete Base Minimizes Delay

By Creighton D. Bickley
Highway Construction Engineer

THE repaving of the roadway of the Bridge Street bridge under the direction of the Engineer of Essex County, N. J., offers some points of interest to engineers facing a similar problem. This bridge is over the Passaic River and connects the manufacturing centers of Newark and Harrison, N. J. It also serves as a main artery for pleasure traffic and long-distance motor hauling out of the Metropolitan district. The roadway is 40 feet between curbs and carries two trolley tracks. A pavement of 2½-inch wood block with a 1-inch sand-cement cushion on a portland cement-concrete base had proved a failure. "Heaves" 6 to 8 inches high and "potholes" caused by disintegrated block made the road practically impassable. The passing of heavy trucks over this irregular surface caused excessive vibration throughout the entire draw span.

After considerable investigation and some deliberation, it was determined to replace the old wood block with a 3-inch sheet asphalt pavement, a 1½-inch top course on an approximately 1½-inch binder course. With a view to increasing the weight on the draw span as little as possible, crushed slag having the same screen analysis as standard binder stone was specified for the coarse aggregate. A reduction of about 27 tons in the load on the draw span was thus obtained.

In designing the top mix, the filler content or "fines" was calculated to show by analysis 15 to 25 per cent passing a 200 mesh. This percentage was to be made up of limestone dust and portland cement in a ratio of 2 to 1. The introduction of portland cement was to stabilize the wearing surface and prevent "pushing" without destroying the flexibility of the sheet asphalt top course. It was hoped that this type of mix would produce the wearing surface best suited to meet the existing conditions.

Before laying out a method of procedure, a careful study of the traffic census was made. Between the hours of 12 noon on Saturday and midnight Sunday, truck traffic was nil, while pleasure traffic reached its peak. Between these hours, therefore, it was planned to carry on the work, as it was less difficult to control the movements of the lighter, faster-moving vehicles. It was also observed that

THE BRIDGE STREET BRIDGE, ESSEX COUNTY, N. J., WITH NEW PAVING, WHICH WAS LAID WITH A MINIMUM DISRUPTION OF TRAFFIC

river traffic was at its minimum at this time. The possibility of little interruption seemed apparent. Further to reduce the possibility of delays, halves or opposite sides of the roadway were to be paved on successive week-ends. However, on the first week-end the work of removing the old block pavement was started Thursday noon. The reason for this decision was the belief that the concrete base would be found disintegrated, severely cracked, or destroyed, and unfit to receive the new pavement. This belief was without foundation, as the existing concrete base was found in perfect condition and in excellent shape to receive the new pavement. However, had the placing of new concrete been necessary, it had been planned to use a mix consisting of one part Atlas Lumnite cement, two parts clean sharp sand, and four parts specification ¾-inch crushed slag. The quick-setting property of this cement would have allowed work to proceed with absolute safety after 48 hours. The fact that this procedure was not necessary facilitated the work considerably.

At this point in the progress of the work, rain halted activities. The repaving of this side of the roadway was not completed until late Sunday afternoon. Making use of the knowledge of conditions previously acquired, work the second week was ordered started at 1 P. M. Saturday, and proceeded unhampered until the completion of the job. At 7 A. M. Sunday the first load of binder was placed. At 1 P. M. the last load of top had received its final cross-rolling, and at 4 P. M. the entire bridge was thrown open to receive the heavy Sunday evening traffic returning to New York.

The binder course had a mix as follows:

	Specified Percentage Per Cent	Batch Weights Lbs.	Actual Percentage Per Cent
Asphaltic cement (50 penetration.........	5	80	5.1
Sand	20	315	19.9
Crushed slag	75	1,185	75.0
	100	1,580	100.0

The specific gravity of a test cylinder was 2.012.

The mix produced a semi-close binder. The top course was designed to meet an analysis as follows:

	Per Cent
Asphaltic cement	11.00 to 11.50
Passing 200 mesh......................	15.00 to 25.00
Passing 80 mesh, retained on 200......	20.00 to 35.00
Passing 40 mesh, retained on 80......	20.00 to 45.00
Passing 10 mesh, retained on 40......	15.00 to 20.00

A specific gravity of 2.2 was sought. The mix was set as follows:

	Theoretical Percentage Per Cent	Batch Weights Lbs.	Actual Percentage Per Cent
Asphaltic cement (50 penetration)	11.0	180	10.7
Portland cement	6.0	100	5.9
Limestone dust	10.0	170	10.1
Asphalt sand	73.0	1,230	73.3
	100.00	1,680	100.0

The averages of the analysis of the samples taken from the top mix are as follows:

	Per Cent
Asphaltic cement	11.0
Passing 200	15.9
Passing 80, retained on 200..................	16.5
Passing 40, retained on 80...................	42.5
Passing 10, retained on 40...................	14.1
	100.0

The average of the specific gravities of the test cylinders was 2.18.

The work was under contract to the Standard Bitulithic Company, 50 Church Street, New York City, which handled the work under the direction of the County Engineer.

Road Work in Ottawa

Abstract from the Interesting Report of the Ottawa Suburban Road Commission, Ontario, Canada

THE total mileage of road under the control of the Ottawa Suburban Roads Commission, John Bingham, Chairman, William Y. Denison and Warren Y. Soper, representing the city of Ottawa, F. A. Heney and B. Rothwell, representing the county of Carleton, and Alan K. Hay, Engineer of the Commission, is 37½ miles. During the year 1923, 5½ miles of asphaltic concrete and 2½ miles of penetration macadam surface were laid. This amount is somewhat larger than that provided for in estimates made early in the season, but was rendered possible by the low contract prices at which asphalt pavements were let during the year. At the rate of $1.39 per square yard, a 3-inch asphalt pavement surface becomes a very economical type where traffic is heavy, according to the Engineer of the Commission, and is especially desirable on account of the ease of maintenance. As in previous years, all pavement was laid on surface-treated macadam base which had been allowed to season under traffic for at least one year.

Grading at Billings Bridge

The widening and grading of a half-mile of road south of Billings Bridge, illustrated herewith, is the largest single construction job undertaken by the Commission up to the present time, and it was in many ways the most difficult.

The Metcalfe Road leading to the bridge is a continuation of the main street of Ottawa and is the principal highway entrance to the city from the south, carrying a heavy traffic at all times. To detour this traffic was practically impossible and it was therefore necessary to arrange the work in such a way as to allow vehicles to pass through the job while construction work was under way. By cutting down one-half of the road at a time, traffic was maintained on the remaining half with some inconvenience. On the whole, the traveling public cooperated in a gratifying way and little complaint was heard under the trying conditions which prevailed at all times, especially during periods of wet weather. The steep hill at this point has long been a hin-

CONSTRUCTING NEW FILL ON BILLINGS BRIDGE
This is an illustration from the Annual Report of the Engineer of the Ottawa Suburban Roads Commission

EXCAVATION TO CUT DOWN THE GRADE AT BILLINGS BRIDGE HILL, BY THE OTTAWA SUBURBAN ROADS COMMISSION

drance to traffic, and its reduction to a 4½ per cent grade has been a very great improvement.

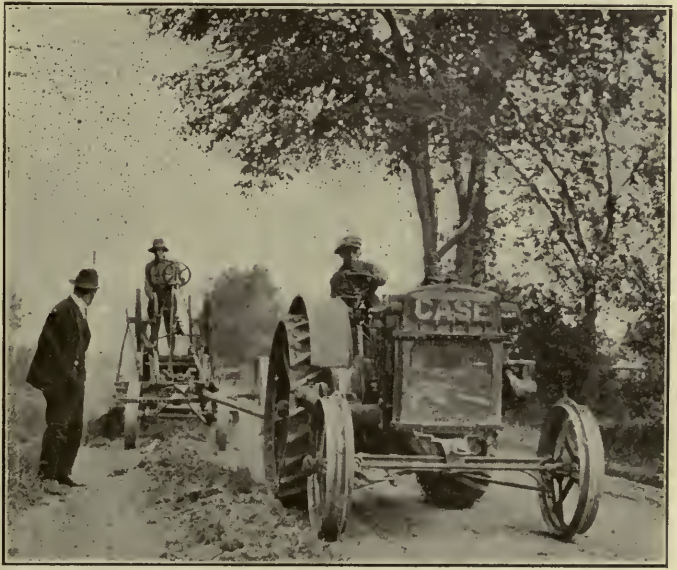
Through the village the right of way was widened by expropriating property under the Public Works Act, and fences were moved back and a steam shovel secured to handle the clay excavation required to reduce the grade. The work was necessarily slowed up on account of traffic passing through the job on one half of the roadway. On completion of the grading, a very heavy broken stone base was placed over the new cut and fill and about 2,900 feet of storm drains installed to take care of the drainage. All work was carried out by day labor, using from one to three gangs as the work progressed. It was not considered advisable to employ contract labor on this work owing to the many uncertain features which would arise, making it impossible for a contractor to submit a fair price in advance of construction.

Maintenance

A gradual improvement in maintenance methods has taken place each year, according to the Commission's report. They rely on light trucks for this work to a greater extent each year. In 1923 the art of repairing bituminous surfaces with a cold-mixed patching material was brought to a high state of efficiency on account of increased experience on the part of the men and improved quality of stone and bituminous material available. It was found that cold-patching of road surfaces may be undertaken with great success provided the material is handled by experienced men with proper equipment. The use of an untrained gang in this work usually results in poorly made patches on the road, which eventually form bumps or waves and destroy its riding qualities. For compacting patches a gas tractor was used, with large rear wheels acting as rolls, and proved more economical than either hand tamping or a large steam roller, where any quantity of patching was to be done.

Twenty-one miles of road were surface-treated, in most cases a 60 per cent asphaltic road oil being used. Coarse sand or gravel was used for covering the oil and was largely drawn and stock piled for the work during the previous winter, when hauling could be done cheaply.

The illustrations used in this article are selected from the large group of effective photo prints which were mounted in the loose-leaf report as distributed.



ANOTHER ILLUSTRATION FROM THE ANNUAL REPORT OF THE ENGINEER OF THE OTTAWA SUBURBAN ROADS COMMISSION, SHOWING A CASE TRACTOR GRADING THE SHOULDER OF A DIRT ROAD

For Fewer Deaths at Railroad Crossings

Comments from a Governor and from State Highway Commissions on THE AMERICAN CITY'S September Editorial

To the Editor of THE AMERICAN CITY:

In my opinion those who drive motor vehicles in Maine gradually are becoming more careful, and I have noticed a marked improvement during the year. This is due largely to such movements as the one in which you are interested, and I congratulate you upon the public service you are rendering.

PERCIVAL P. BAXTER,
Governor of Maine.

To the Editor of THE AMERICAN CITY:

I think we should agree that some united effort among the states should be started to uniformly protect grade crossings. It is almost out of the question to eliminate even the main line crossings by separation within the next ten years. It will be a very heavy construction program to eliminate them all.

Figures from the Bureau of Statistics of the Interstate Commerce Commission show the number of grade crossing accidents and of persons killed and injured in them during the last few years, as follows:

Year	Number of Accidents	Killed	Injured
1921......	4,019	1,705	4.868
1922......	4.361	1,810	5,383
1923......	5,218	2,268	6,314

In the meantime, strong measures should be established for both the railroad and the highway at grade crossings. Every grade crossing should be protected with electic wigwag signals and a bell. Other dangerous crossings should be designated by the state highway commission and traffic required to stop before crossing the railroad. In such cases the state should have police power and enforce the stop orders. Stop orders should not be on all crossings, but only those that the commission considers hazardous. More signs should be erected than just the original sign now used, warning the traveling public when approaching a crossing. The so-called island or obstruction in the traffic way, compelling traffic to slow up at grade crossings, should not be allowed. Most of these so-called islands are more dangerous to traffic than the crossing itself.

THEODORE GARY,
Chairman, Missouri State Highway Commission.

To the Editor of THE AMERICAN CITY:

I have read the editorial on "A Program for Fewer Deaths at Railroad Crossings" with much interest. This is a subject of great public importance and should receive much more public attention.

In Wisconsin the Highway Commission has been doing all that funds permit to eliminate the grade crossing. The cheapest method is usually to relocate our heavy-traffic roads so as to eliminate the necessity for crossings wherever this can be done. When you consider that the estimate your editorial gives of the proposed cost of New York's program means an average of $100,000 for each crossing structure, it is evident that most drastic relocations can be made in many cases at a very much lower cost to the public.

Another point to be remembered is the fact that the public pays all the bills. In these days of public regulation of rates and limitation of profits, added expenditures by the railroads can only come from increased rates. Making the railroads pay a part should be recognized as merely a means of distributing the burden of expense so that the consumers of railroad service will pay a fair proportion as compared to the various taxing units of the state.

The problem in our state is looked upon as one in which the Railroad Commission, the Highway Commission, and the railway companies are jointly interested. The two commissions are instituting a joint study of crossing problems to determine the various ways of handling the matter most cheaply and effectively for public safety and to select the most dangerous conditions for earliest treatment.

Your editorial indicates that the cost of New York's proposed program will be about $800,000,000, to be spent in 40 years. A similar program in Wisconsin would cost $500,000,000—more than the total value of the railroads. It is a matter of grave doubt whether even our rich country can stand such enormous burdens. My own opinion is that the public ought not and will not spend such vast sums for this purpose. There are too many ways in which the public welfare calls for service to permit such extravagant use of funds for a single enterprise.

If my conclusion is right, we shall have the danger of railroad crossings with us for several generations. The problem therefore resolves itself mainly into one of educating the public to exercise due caution.

I do not mean by this to imply even in a slight degree that we should let down in our efforts to get rid of grade crossings. We must keep this matter constantly before us and get rid of the most dangerous crossings on main roads first and of the others as fast as the funds will permit. But the only quick method of reducing crossing accidents will be by popular education and by the development of effective warning signs.

W. O. HOTCHKISS,
Chairman, Wisconsin Highway Commission.

To the Editor of THE AMERICAN CITY:

I have read with interest the editorial entitled "A Program for Fewer Deaths at Railroad Crossings." The editorial is unquestionably based on facts, and my only comment is that too much stress cannot be placed on the early cooperation of both state and railroad officials for a standard as to type and location of both the advanced warning sign and audible and visible signals to protect crossings until a separation can be effected.

LEROY GREENALCH,
Acting Engineer of Bridges and Grade Crossings,
New York State Department of Public Works.

How Kenilworth Is Carrying Out Its Village Plan

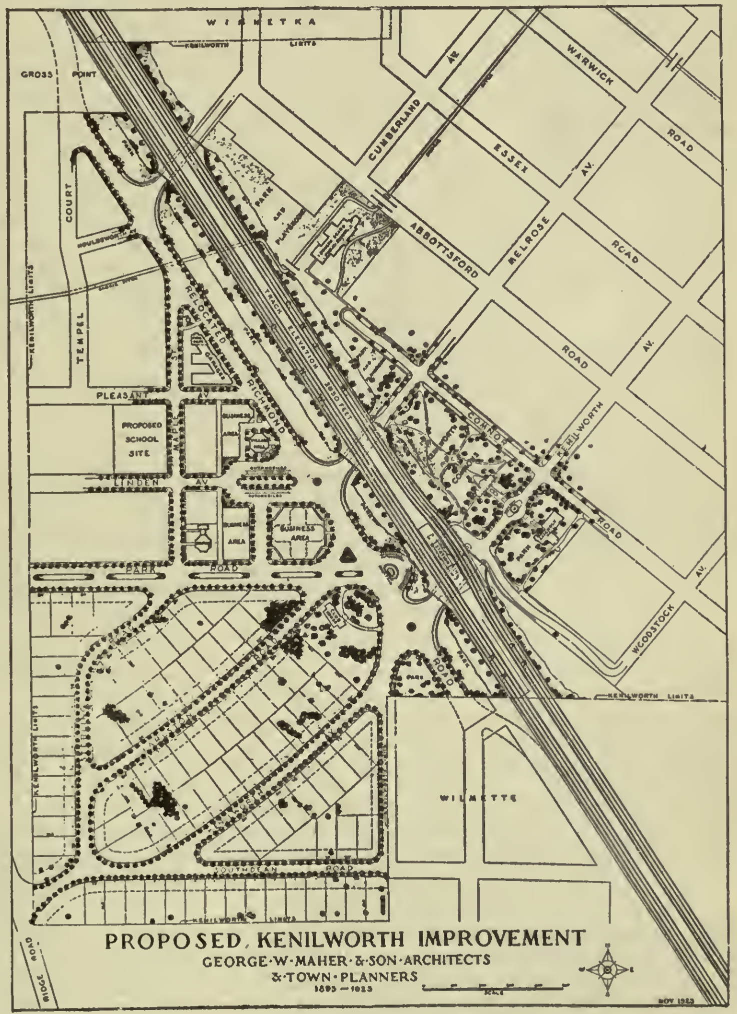
By F. L. Streed

Village Manager, Kenilworth, Ill.

KENILWORTH is a residential suburb of Chicago having a population of 1,700. From its very beginning in 1890, its growth has been regulated by rigid private restrictions, including building lines, minimum cost of buildings permitted, etc. However, since adjacent territory to the west not protected by such private restrictions has been annexed, we have found it necessary to adopt a comprehensive zoning and village plan.

Our zoning ordinance is different in some respects from the average. In our "A" Residence District, we have a 40-foot minimum setback (building) line for both frontages on corner lots as well as for the principal frontage on "inside" lots, although where setback lines of 50 or 60 feet have already been established these are maintained. The minimum lot area in this district is 12,500 square feet per family, which is equivalent to a lot having a frontage of 75 feet and a depth of 165 feet. We believe we can substantiate in court the reasonableness of these regulations, since most of our building lots are 100 x 175 feet.

The steam and electric interurban lines, having parallel and adjacent right of way through the village, plan to elevate in about a year, at which time they expect to provide for four tracks each. If only the present right of way were available, unsightly vertical concrete retaining walls with their attendant "death - trap" subways would be the result. To circumvent this, the Kenilworth Plan Commission worked out a plan, accepted by the Village Board and the railroad officials, which provided for the acquisition by the railroad companies of the right of way of the streets paralleling the tracks on each side, thereby permitting the construction of gently sloping earth embankments which will be landscaped and treated from an architectural standpoint.



The plan further provides for the acquisition by the village, by condemnation or otherwise, of the tier of lots facing the railroad, for the purpose of widening and moving the street 125 feet. By thus moving the street and using the land between the street and tracks for a park, we shall be enabled to eliminate the "death-trap" subways; the construction of sweeping curves allowing motorists a clear view after emerging from the subway before entering the re-located street. The portion of this street through Kenilworth is to be a link in a through truck traffic route through Glencoe, Winnetka, Kenilworth, Wilmette and Evanston, connecting on the south with the new McCormick Highway to be constructed leading into Chicago, and on the north with Green Bay Road. The first four villages above mentioned, by acting in unison, have secured from the County Commissioners an appropriation of $100,000 to be applied on the cost of constructing the pavement.

At the time the Kenilworth Plan was adopted, the railroads were not yet ready to proceed with track elevation and the village was not yet ready to acquire the land necessary to carry out the plan. Therefore, since the land values were rapidly increasing, fifty public-spirited citizens, subscribing from $1,000 to $20,000 each, organized a syndicate to acquire all the land required to carry out the village plan which they could purchase at reasonable prices, one of the stipulations being that any land required by the village would be turned over by the syndicate at cost.

Shortly after the organization of the syndicate, a 40-acre golf club adjacent to the village was put on the market for subdivision purposes. The highest bidder was a real estate firm which planned to subdivide into small lots and build small houses for sale purposes, a development which was not up to the standard established in the remainder of the village. In order to maintain that standard, the syndicate purchased the property, subdivided it, and is developing it in accordance with the village plan. A 40-foot strip on the north end of the subdivision was dedicated without cost to the village to allow the construction of the two-way street called for on the Village Plan. Special assessment proceedings for paving these streets have been started. Condemnation proceedings will soon be started to acquire those lots, not already owned by the syndicate, which are needed for the through truck traffic route. Most of the property east of the tracks shown on the Plan as "park" is already park. The Park Board has already purchased the only two commercial buildings east of the tracks and proposes to purchase the few residences now located in the proposed park extension.

It will no doubt be several years before the entire plan is realized, but on account of the cooperation of the railroads, Village Board, Park Board and Plan Commission, it is financially feasible, and is being carried out step by step.

Street Improvement Association's Work Proves Contagious

INSPIRED with a desire to make and keep Beech Street one of the cleanest and most attractive spots in the city of Helena, Ark., the residents of this street, upon the suggestion of Mrs. Edward S. Ready, a short time ago joined in forming what is known as the Beech Street Improvement Association, with Mrs. Melvin Neely as Chairman. The principal object of the organization is to arouse in every householder and resident of Beech Street a sense of individual responsibility for the appearance of the street.

Invitations to attend evening meetings at a local club house or at the homes of some of the residents were issued by telephone and through the newspapers to all those living on Beech Street, and at these gatherings informal round-table discussions were held on how best to meet the various problems facing the householders. As a result, fourteen definite points to be observed in the effort to keep the street clean and beautiful were drawn up and officially adopted by the Association. These were printed on placards and distributed to each home along the street, with the suggestion that the card be kept for ready reference.

Spiraea was chosen as the Beech Street flower, and the residents were urged to cultivate this hardy and beautiful plant. It was also voted that the planting of native elms on the parkways, in preference to other trees, be encouraged as far as possible.

Not only has this endeavor brought about a marked improvement in the appearance of this particular street, but it has led to the formation of several other street improvement associations in Helena; in fact, a keener interest in city beautification and sanitation has become evident throughout the city. A prominent local club-woman who has long been active in clean-up movements was recently asked to accept the position of honorary sanitary inspection officer for the city, a committee being appointed to assist her. She has energetically entered into the work, going into all corners of the city to point out where conditions needed attention. Through her efforts, substantial money prizes have been raised for presentation to the wards showing the greatest improvement at the time of a second inspection. This money will be expended by the winning wards in keeping vacant lots in order and in other work of this kind.

Highway Departments and Traffic Control

By G. Cameron Parker

Departmental Secretary, Ontario Department of Public Highways

PRIMARILY the control of all roads rests in the state or province. American and Canadian law agree on this point. The state or province may, however, delegate the entire or partial control of roads to the county, township or urban municipality. It may place the general supervision of the roads under the municipal corporation and at the same time exercise control of certain phases of highway law which apply to the state as a whole, the municipality still retaining the power to pass laws of local interest and local application.

Since highway departments are required to build and maintain roads, and since the behaviour of traffic is a governing factor in road life and service, the road authorities should, in the writer's opinion, take a leading part in formulating traffic laws and have definite control of their enforcement.

This principle has been recognized in the highway legislation of the province of Ontario. In 1916 the registration and licensing of motor vehicles, chauffeurs and garages was vested in the Department of Public Highways, which is administered by the Minister of Public Works and Highways. Public sentiment had demanded, not only in Ontario, but elsewhere, that the revenues received from motor vehicle registration should be earmarked for, and spent entirely on, roads, and this policy has been adopted in most states and provinces. Public support has also been extended to the placing of the licensing of motor vehicles under the highway departments. This has been done in the states of Arkansas, Nebraska, Oklahoma, Rhode Island, South Carolina, Tennessee, and West Virginia. If, therefore, as in many states, the highway departments not only control the state roads, as far as construction and maintenance are concerned, but also are responsible for the registration of motor vehicles and the collection of the revenue therefrom, it is logical to place the enforcement of traffic laws in the hands of the same authorities.

"Traffic Must Be Served"

That the scope of the work of a highway department is broader than the mere construction and maintenance of road surfaces was aptly expressed by H. A. Hirst, Wisconsin State Highway Engineer, when he said:

"A county or state highway department should not exist merely to design and build a few miles of highway and a few culverts and bridges. They should exist to give transportation service to their clients. They should strive to arrange the laws and their practice so as to give it now, not in 1950. The thing which we should strive to serve is highway traffic. We should be purveyors of transportation to his majesty, the American people. Traffic must be served!"

The writer of the accompanying article believes that the supervision of traffic on state highways should be delegated by legislative enactment to the highway departments. The article offers suggestions as to the organization and duties of state highway traffic corps. Comments on these ideas are invited.

A Legal, Engineering and Economic Problem

The cost of maintaining roads, gravel or broken stone particularly, is directly dependent on the volume and speed of motor traffic. The control of speed is, therefore, not merely a legal matter; it is an engineering and an economic problem. It not only interests the road supervisor; it vitally affects the taxpayer. A comparatively light motor traffic at an excessive speed, will destroy a gravel road more rapidly than a greater volume of traffic at a moderate speed. The same may be said of the effect of heavy trucks on pavements. The destructive effect is due to two factors, weight and impact. Impact is governed by speed. A pavement that may successfully withstand a stationary or slow-moving load may be shattered by a lighter load traveling at high speed.

Protection of Workmen and Property

Protection of day labor construction and maintenance gangs working on roads carrying heavy traffic is frequently necessary. For this duty traffic officers operating at the direction of the engineers or superintendent in charge of the work should be employed. They should warn traffic by a word or a wave of the hand, and drivers who are careless of precautions when passing the men at work should be summarily dealt with.

Highway departments have, during the construction season, large quantities of materials and stores placed at points along the road for use when occasion demands. These are of easy access and present a strong temptation to local residents and to a certain class of person using the road. The guarding of these supplies should be part of the traffic officers' duties, and the prosecution of persons stealing them should be energetically undertaken.

MEMBERS OF THE MOTOR-CYCLE SQUAD ARE READY TO ASSIST TRAFFIC AT PLACES WHERE HEAVY SNOWS CAUSE TROUBLE

Service to Traveling Public and Other Duties

In addition to being guardians of public welfare through enforcement of law, traffic officers can render valuable service by acting as guides to tourists. They should be supplied with road maps, reports from the head office as to road conditions and detours in all parts of the state, and should be in a position to give accurate information concerning routes and roads. They should also render every assistance to motorists in difficulty, directing them to the nearest garage or service station, and, if necessary, procuring service cars either by telephone or personal call, provided, of course, that their regular duties are not seriously interefered with.

Other duties pertaining to the proper administration of roads can be more thoroughly carried out by traffic officers of the highway department, such as the prevention of dumping of rubbish on the right of way, the apprehending of those damaging the trees or committing other acts of vandalism. Extraordinary traffic, such as traction engines, steam shovels and ditching machines must be closely watched. These are invariably equipped with wheels having cleats or flanges which damage the road surface. Such traffic should not be allowed to use roads with paved surfaces without special permits from the engineer, and this should be granted only after examination has convinced him that no serious damage to the road surface will result.

Traffic Officers or Police Officers?

It is evident, therefore, that the regulation of traffic is not a matter of law enforcement alone. In the process of traffic control the law must be used, but through the punishment of offenders only we can never hope to serve the best interests of the public or the state. Education on the part of the state and willing cooperation of the traveling public are essential to effect the desired results.

Police officers are engaged in the detection and punishment of crime. They deal almost entirely with the criminal classes, and cannot consequently be expected to have the proper attitude towards the wayward motorist who may thoughtlessly "step on the gas." Motorists are, with few exceptions, respectable, law-abiding citizens. They are not criminal in attitude or action and consequently must not be dealt with as such. They appreciate a timely, polite, but firm warning and will cooperate with the authorities issuing it by more carefully observing the law. This does not mean that all offenders should be let off with a warning. Many should not; it should be part of the traffic officer's duty to exercise discrimination and, summons or no summons, the offender should be stopped at the time and told that he was breaking the law.

This will largely overcome the criticism heard on every side, of the unfairness of prosecuting motorists for offences of which they had no knowledge until a summons was received.

Organization of Traffic Division

In organizing a corps of traffic officers, one principle should be kept clearly in view—that is, the uniform enforcement of traffic regulations in all parts of the state. It will not do to allow a latitude of 5 miles over the legal speed limit on one road and to enforce the legal speed limit on another. This will necessitate that all orders and instructions pertaining to the conduct of officers shall emanate from one official or director at head office.

At the same time, traffic officers should be at the disposal and under the supervision of the district or division engineer, who can retain a closer supervision of their work and direct their movements to the best advantage. Between the director at head office and officers on the road there should be inspectors, each in charge of a district, their number depending on the size of the state and the number of officers on duty. The inspectors should act as liaison officers, reporting to head office, meeting the men in the field and solving their problems with them, supervising their conduct in courts and assisting them in the prosecution of the more complicated cases.

The division of control should be definitely and clearly understoood, in order that no conflict of authority may occur. All matters pertaining to the enforcement of the regulations should be dealt with by the director through the inspectors, while the direction of the movements of officers and the responsibility for seeing that they are on duty should rest with the engineers in charge of the roads. When for special reasons their movements must be controlled from head office, the engineer should receive a copy of the instructions.

Routine Reports

In order that the director of traffic officers may keep a close watch on the work done by the men, each officer should report weekly, on forms supplied for the purpose. These reports should show for each day the section of road patrolled, the total mileage traveled, the number of hours spent on the roads, hours spent in court, and where, the number of warnings given to traffic and the license numbers of all vehicles entered for prosecution, together with the sections of the law violated. "Remarks" re lost time, weather and road conditions, etc., should be included. These reports are of value in many ways.

A second report should likewise be received weekly showing the disposal of court cases, giving the license number, name and address of owner, section of act violated, name and location of magistrate, and the penalties and costs. Space should be provided for indicating withdrawals, dismissals and remands.

Both reports should be forwarded to head office in duplicate, one copy going direct to file for record and the other to the inspector concerned, who should carefully go over it and take immediate action on any points requiring attention. A control chart should be kept and the receipt of reports checked up, delayed or omitted reports being followed up by letter. The control chart should also show the number of cases prosecuted each week, so that the total for each officer and the grand total for each week can be seen at a glance without the necessity of referring to each report. If considered desirable, this control chart can be extended to include the totals of penalties and costs, where these are payable to the state.

TRAFFIC OFFICER OF THE ONTARIO DEPARTMENT OF PUBLIC HIGHWAYS AT WORK ON THE PROVINCIAL HIGHWAY FROM TORONTO TO MUSKOKA

Lengths of Patrols

A determination of the length of the road to be patrolled by each officer will be made in the light of existing traffic. Adjacent to cities and large towns, suburban traffic is comparatively heavy, consequently the patrols should be short, from 6 to 12 miles. In outlying districts where traffic is light, one officer can adequately look after 80 miles, provided that he lives at the approximate center and can spend alternate days in each direction. The trend of traffic is changing, becoming heavier on some roads and lighter on others in different seasons of the year, and an elastic organization should be provided. Married men, for example, should be located at headquarters more or less permanent, since unmarried men can be moved with less inconvenience and with greater dispatch.

Ownership and Maintenance of Motor-Cycles

Motor-cycles should be supplied by the men, who should have added to their salary a daily allowance to cover this. Such an arrangement has been in effect in Ontario since the inauguration of the work, and has been found eminently satisfactory. The Province is relieved of the capital investment in machines having a large annual depreciation, and no mechanical or overhead staff is required to supervise the purchase and maintenance of the equipment. There is not the same tendency for extravagance in operating on the part of officers that there might be if they did not own the motorcycles. The machines are also kept in better running order. Along with the matter of salary, the amount allowed for the motor-cycle should be considered. In Ontario it is estimated that from $1.50 to $1.75 per day will about cover interest on investment, annual depreciation, and operating expenses. In the United States, where the cost of purchase and that for gasoline and tires is somewhat lower than in Canada, an allowance of $1.50 per day should be ample.

Half-Pay During Winter

In the winter, except in the southern states, traffic is light and the same supervision is not required as in summer. It is, therefore, not sound economy to retain all traffic officers on full pay. On the other hand, it is not desirable to discharge the men in the fall and engage possibly all new men in the following summer. A compromise that effects a saving and at the same time retains trained men is to place the best men on half-salary for the winter months, say from December 15 to April 15. They appear to be willing to accept this arrangement on account of the assurance of employment for the remaining eight months of the year. There are a number of men who are not satisfactory and who do not measure up to the standard required, in judgment, personality or integrity. Such men should be discharged and not reappointed. The winter months offer a good opportunity for "house-cleaning."

Conclusion

Improved highways represent a large investment made by the states on behalf of the people. The public is the owner and has a right to expect a just return from this investment in the form of service over a prolonged period. With the state highway departments rests the responsibility for securing this service. They take infinite pains to secure the best results from expenditure on construction and in making every dollar count. They are under the close scrutiny of the public in making this expenditure and are unqualifiedly condemned if the roads are not properly maintained and repaired. Yet they take little or no interest in the protecting of the roads and in reducing the maintenance charges by controlling traffic and eliminating as far as possible those particular types of traffic that jeopardize the life of the roads and cause high maintenance costs. Millions of dollars are spent in draining the roads, in guarding against and preventing destruction from beneath the surface, but little is being done in protecting the roads from destructive agents above the surface, from heavy loads and excessive speed. Money spent on traffic control is the cheapest form of insurance procurable. Highway departments should not only undertake traffic control of their own volition and in their own interests, but they should be required by legislative enactment to be responsible for the supervision of traffic on state highways.

Continuous City Planning

IN large cities a special city planning department should always be maintained, and, as a matter of fact, in practically all of the large cities such planning departments of varying degrees of effectiveness are maintained. In the city and town under 50,000 the only feasible way to carry on continuous city planning is to have the consultant who was engaged on the preparation of the original plan also engaged, on the basis of an annual fee, to give adequate attention to the interpretation, adaptation, and development of the city plan. A draughtsman might very well be installed to look after the collection of data and the preparation and revision of drawings. Furthermore, it is of very great importance that the city engineer and also the city manager, where there is one, understand the purpose and foundation of the city plan and its application step by step.

No matter how much attention the consultant gives, the actual detailed preparation of plans will be in the hands of the city engineer. This is the reason why some training in city planning for all students of municipal engineering in the colleges and universities is of the greatest importance in their future work. Only a few of the engineering schools have realized this opportunity for improving the qualifications of their students in municipal engineering at a critical time in the development of this profession.

I am convinced that the city planners and the cities that hope to realize the promise of the city planning idea must add the continuous city planning item to their program. A technical department is necessary, ranging from the occasional advice of the consultant, with perhaps a permanent draughtsman, up to a fully-manned corps in the larger cities. City planning budgets should anticipate this expense, which is a sure economy in the long run.

—From a paper presented by Jacob L. Crane, Jr., at the annual convention of the American Society for Municipal Improvements, held in Boston, September 29-October 2, 1924.

Why Not a Commercial Drivers Club in Your City?

THE accidental killing of a curly-headed six-year-old girl by a truck—though no fault of the driver—started a movement among drivers of commercial vehicles that has resulted in the organization of a safe-driving club in Grand Rapids, Mich. It is known as the Commercial Drivers Club. Only truck drivers may be active members. Any one employing drivers or interested in the furtherance of the work is eligible to associate membership. The membership fee is $1 per year. With the initial membership of 25, the Club has grown to 579 members and is still growing. A radiator emblem (see picture) is carried by each member.

The Club has been developed through the initiative of the drivers themselves and not only bids fair to be one of the strongest units in the public safety program of Grand Rapids, but is prima facie evidence that truck drivers as a rule are a sober, industrious, responsible type of citizen, notwithstanding public opinion to the contrary.

The members of the Club are in earnest. They have banded together to eliminate the reckless truck drivers who are a constant menace to life and limb and to live down the undesirable reputation gained through the misconduct of a minority of drivers.

An idea of the object of the Club may be gained by a glance at Section 1 of the By-laws, reading as follows:

Section 1. The object of the Commercial Drivers Club shall be to:

(a) Function in close cooperation with the Grand Rapids Safety Council in its effort to promote and aid in the conservation of individual, industrial and community life;

(b) To conduct a continuous educational safety campaign among commercial drivers, as a result of which they as a class shall be known as the most careful drivers in Grand Rapids and by their example set a standard of safe driving for all;

(c) To thoroughly familiarize each member with local and state traffic laws, and encourage compliance therewith;

(d) To function as an organization through which commercial drivers may find expression for their ideas regarding present and future laws governing the operation of motor and other vehicles on our streets and highways;

(e) To promote, endorse, or oppose, as it shall deem necessary, any local, state or national legislation affecting traffic, but not to affiliate with any political, social, or commercial schemes or enterprises not in strict accord with the purpose of the Club;

(f) To teach and keep constantly before its members individual responsibility of safety to themselves, their families, their employers, and the community in general;

(g) To promote acquaintance and develop good fellowship among commercial drivers.

Much corrective work is being done by members, both by personal suasion and by reporting hazardous conditions when found to exist. Reports of these conditions are made upon especially prepared forms. They include bad places in streets, broken stairways, dangerous conditions on highways outside the city. The Director of Public Safety of Grand Rapids and the Kent County Road Commission have both corrected conditions as suggested by Club members. Both these departments recognize that constant driving about the city and county qualifies the members to make suggestions.

By meeting once a month, an opportunity is afforded to bring closer together the law-enforcement bodies, the truck drivers, their employers, and the general public. In this way a better understanding of each other's problems results. And in the meantime the drivers are learning individual responsibility of safety to themselves, their families, their employers, as well as to the community in general.

Motor vehicles are responsible for 15,000 accidental deaths annually in the United States. Many of these deaths are caused by motor trucks. These and other accidents cause employers many dollars, resulting in a tremendous economic loss in every city. From a humanitarian or a dollars and cents standpoint, it seems, therefore, that any city might easily profit from a Commercial Drivers Club such as this, organized under the auspices of the local Chamber of Commerce or Safety Council. Full particulars may be had from the secretary, Major R. C. Haven, care Grand Rapids Safety Council, Association of Commerce, Grand Rapids, Mich.

EDITORIAL NOTE.—Two recent leaflets of the Department of Public Safety of Grand Rapids can also be obtained of Major Haven. These are "The Police Want You" and "Questions and Answers on the City Traffic Ordinance and Michigan Motor Vehicle Laws."

A County Organized for Fire Protection

By Philip P. Sharples

COLONEL WILLIAM B. GREELEY, of the United States Forestry Service, after a recent inspection of the fire-fighting organization of Los Angeles County, pronounced it exceptionally well organized and eminently progressive. Stuart J. Flintham is County Forester and Chief of the County Fire Department. Norman C. Johnson is Deputy.

The fire work is peculiarly important on account of the long rainless summer and has led to intensive methods in no half-hearted way. The area protected is 4,000 square miles and the population of the county is 1,500,000—not essentially different from the area and population of Connecticut. The population is, however, concentrated in the valley areas, with a large proportion in Los Angeles. The area of the Santa Barbara and Angeles National Forests, about three-fifths of the whole county, is wild land, for the most part steep mountain sides covered with brush growth. Brush fires are hard to control, as the canyons form natural funnels which lead the fires to the mountain-tops.

The fire-fighting is organized separately for the wild area and for the settled area. The work on the wild lands is done in cooperation with the National Forest Service, the State Forester, and certain corporations interested in water-supplies drawn from the watersheds of the mountain areas. All work is coordinated and the closest cooperation prevails in all fire-fighting work. The costs are borne by the authorities under whose jurisdiction the burned area comes. In case of border-line fires, the cost is divided in accordance with the area burned.

The National Forests are patrolled by rangers. The unincorporated territory of the county is looked after by fire wardens who are residents in the area served. They are both paid and volunteer. There are 150 in the county. The state law gives them very complete police power in the case of fire or fire danger. They can commandeer men and supplies, make arrests, set back fires, and take full charge of fire fighting. The county fire wardens do not perform patrol duty except in case of emergency, as it is felt that better results are obtained with a more numerous resident distribution than by patrol.

Smoking Prohibited on Forest and Brush Land

On August 18, 1924, the following ordinance was passed by the Board of Supervisors of Los Angeles County:

Sec. 1. The Board of Supervisors hereby declares that an emergency, due to the extreme dryness of the vegetation and the great danger of destructive forest and brush fires resulting therefrom, exists in the county of Los Angeles.

Sec. 2. It shall be unlawful during the period of the emergency herein-above declared, for any person to shoot, fire or discharge any rifle, shotgun, pistol or other firearm upon or onto, or to smoke tobacco or other substance, in any forest land or land covered with brush, grass or other inflammable material in the county of Los Angeles outside of incorporated cities, except as provided in Section 3 hereof.

Sec. 3. This ordinance shall not apply to the owner of property while on his own land, nor shall it apply to the discharge of firearms in the necessary defense of person or property, nor to the discharge of firearms by peace officers in the performance of their duties.

Sec. 4. It shall be the duty of the County Fire Warden to enforce the provisions of this ordinance.

Sec. 5. Any person violating this ordinance shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not over five hundred dollars, or by imprisonment in the county jail for not over six months, or by both such fine and imprisonment.

Sec. 6. Provides for taking effect immediately and remaining in effect until December 1, 1924.

Sec. 7. Provides for publication.

The fire wardens make full investigation of every fire in their districts and make reports to the Forester. In the period July 1, 1923, to June 30, 1924, 417 brush fires were reported and the causes were given as follows:

Brush and rubbish burning	155
Tobacco from autos	97
Unknown	57
Camp-fires	42
Hunter's tobacco	26
Incendiary	9
Sparks from engines	7
Children and matches	7
Autos on fire	4
Miscellaneous	11

Of the total area burned, only 33.75 out of the 21,407 acres were timber.

It is interesting to compare these figures with the figures for the National Forests of the whole state, compiled for 1923:

Lightning	650
Railroads	28
Campers	119
Smokers	358
Brush burning	44
Incendiary	77
Lumbering	35
Miscellaneous	61

Of the total burned, 158,746 acres, 13,459 were timber-land.

The entire absence of lightning fires in Los Angeles County and the large number in other parts of the state is marked. In a single recent storm north of Shaster eighteen fires were set. In Los Angeles, on the other hand, there is no possibility of the quenching of fires by rain, as none falls from May first to November first in a normal year. At present, conditions are particularly aggravated by two successive dry winters, causing an extension of the dangerous season and the dangerous area.

Practical experience and a study of the figures have convinced the County Board of Supervisors that a large proportion of the preventable fires are due to careless smokers, especially those riding through brush area in automobiles. In order to lessen this danger and to give the fire wardens added authority, the ordinance on page 440 was passed on the 18th of August.

The county has also in effect an ordinance prohibiting the building of bonfires or burning slash or other rubbish, or blasting, from May 1 to December 1 without a permit from the fire warden. This ordinance is in line with the usual city ordinances.

The population in the unincorporated area of the county has increased so rapidly in the last few years that the county has seen the need of organized fire departments and motor-equipped apparatus. The situation was recognized by the Legislature, and a bill was passed in 1923 allowing the formation of county fire protection districts. The Board of Supervisors of the county is made the governing body.

The Los Angeles County officials have construed the terms of the act liberally and have consolidated the management and direction of the various fire districts instituted into a county fire department organized and run along the lines of a modern city fire department.

Thirty-two fire districts have been organized, with two battalion chiefs, who report to Chief Stuart J. Flintham. The county has under the law authority to assess special taxes, to purchase fire apparatus, to acquire real estate, to appoint agents and employees, and to provide rules and regulations for maintaining the district fire departments.

If any district is annexed to an incorporated district or made into an incorporated district, the bill provides that all the assets of the fire district shall be turned over to the incorporated body.

Fire prevention in the unincorporated area of the county is provided for in the Los Angeles County Fire Protection Bureau. The Bureau, under the authority given by the State Fire Menace Abatement Act, has the power to enter premises and abate fire hazards. Over 2,500 building lots were cleared in 1923.

The education of the automobile public is an important part of fire prevention. Practically every family in Los Angeles County owns an automobile; some own two. There is one for every two and nine-tenths persons, a total of 430,000 in the county. Fire notices are posted everywhere on open land. Various agencies, including the National Park Service, the State Board of Forestry, chambers of commerce and gasoline stations supply wind-shield stickers calling for fire prevention.

Escape from a warning seems difficult, and yet in the past fiscal year brush fires resulted in a property loss of $111,744.15. Under the penal code, 151 persons were arrested and 131 convictions obtained.

Very serious fires have occurred this autumn, and the officials and the system have been tested as never before. The most serious fire has occurred in the San Gabriel Canyon and has been extremely difficult to control. It has continued to burn and to break out of bonds at intervals, and Colonel Greeley has therefore approved a regulation barring travel in the Angeles National Forest except on traveled roads and to designated camping-grounds.

A Year of Zoning in Providence

The Providence Zoning Ordinance Has Not Been Before the Courts—The City Has Not Had to Institute Any Action to Enforce It, and No Property Owner Has Resisted Enforcement

By Charles F. Fisher

THE zoning plan of Providence, R. I., was prepared by Robert Whitten of Cleveland under the supervision of the ordinance committee of the City Council. Eleven months were devoted to its preparation and to numerous conferences with the ordinance committee, city officials, and civic organizations. It was passed by the City Council and approved by the Mayor on June 6, 1923.

An amendment to the Rhode Island zoning enabling act was secured to make the state act comply generally with the standard zoning enabling act prepared by the committee appointed by the Secretary of Commerce. The ordinance accordingly provides for a Board of Review with large specified and discretionary powers. The Mayor and City Council appointed a Board which has had the confidence and respect of the community. It is a representative body, one member being a lawyer, one a realtor, one an architect, one a structural engineer and builder, and one a prominent business man who is the chairman. The Board selected a secretary who has rendered conspicuously intelligent and efficient services. To the Board and its secretary, much credit is due for the successful operation and satisfactory administration of the Providence zoning law.

All property owners who have sought information or advice in the office of the Board have received courteous attention and considerate assistance. It has been the unvarying rule to see that every one secured all the rights to which he was justly entitled under the provisions of the ordinance, no less than to explain what the regulations prohibited. By giving a fair and clear explanation of the reasons for provisions, the concurrence of property owners has generally been secured. It has been recognized that zoning exists to direct development, and not development to exemplify zoning. The prevailing good feeling in Providence towards zoning has been brought about largely by the way the zoning office has been conducted, and by the fairness shown and good judgment exercised by the Board in its deliberations and decisions.

Just How Has Zoning Worked?

The proof of the value of a law is not found in its purpose but in its practical operation and effect. So it is with zoning. This is why citizens and officials of unzoned cities would like to know, and are trying to find out, just how zoning has worked, what it has accomplished, and what people think about it where it has been tried. Replies to inquiries are usually vague and general. Specific facts and concrete data are not generally available in zoned cities, because adequate records have not been kept of all questions and matters that have come up as a result of the enactment of the zoning ordinance. The zoning administration authorities of the city of Providence, however, have a record of Providence's experience with the zoning system and of every important happening in the zoning office.. From this record and from personal observation and contact with the office of the Board of Review, this article has been compiled.

Activities of the Board of Review

The Board of Review held thirty-one meetings, of which thirteen were public hearings, during the first twelve months. A quorum was present at all meetings and a full attendance at eighteen meetings. One member was present at all meetings, and one was absent only once. The average attendance was 90 per cent. It has been the rule for all members to view the property before taking action on any appeal. In all cases, the decisions of the Board have been unanimous. The members of the Board have served without compensation.

During the year ending July 1, 1924, the Building Department issued 4,177 building permits and the zoning Board of Review had only 71 appeals to vary the application of the provisions of the zoning ordinance. During the same period 853 people came to the zoning office for information as to the restriction imposed on their property by zoning. About one-half of these found that the intended use of their property complied with the law. It developed that the other half were planning to do something that was contrary to some provision of the ordinance. In 187 instances, owners wanted to use their property for a purpose that did not conform to the regulations of the use district in which it was located. Of this number, only 23 felt that they had a case that entitled them to an exception, and appealed to the Board of Review for a variation in the application of the provision affecting the use of their property. Eleven proved their cases to the satisfaction of the Board and were granted special permits.

Non-conforming uses, which are uses that do not conform to the regulations of the use district in which they are located, furnished the second largest number of appeals. There were 18 of these, of which 15 were granted.

In some 40 instances, owners desired to house three or more families on lots where, under the area district provisions, only one or two families were permitted. Only 7 made appeals, of which 5 were granted.

In 45 cases, owners wanted to build beyond the front-yard line, but only 8 decided they could make out a good case. The Board granted 7 of these appeals.

Forty-three owners made known their desire to build private garages in residence districts nearer than 20 feet to the street line, but only 14 felt they could show undue hardship. The Board agreed with 11.

CHARACTER AND DISPOSITION OF THE 71 CASES APPEALED TO THE BOARD OF REVIEW DURING THE FIRST YEAR OF ZONING IN PROVIDENCE

Type of Appeal	Granted	Denied	Withdrawn	Total
Variation of use district regulations	11	11	1	23
Extension of non-conforming uses	15	2	1	18
Variation of area district regulations	5	1	1	7
Variation of front-yard line regulations	7	1	..	8
To build private garages beyond 20-foot line	11	3	..	14
To exceed percentage of lot occupancy	1	..	..	1
Total number of appeals to the Board	50	18	3	71

In nearly all cases, special permits were granted subject to conditions designed to safeguard surrounding property. For example, a stone quarry and crusher in a dwelling-house district was permitted to install brick-making machinery to utilize its waste material on condition "that the existing rock-crusher be enclosed to prevent the escape of dust, that all rock be wetted before entering the crusher, and that the conveyors of material to the brick-making plant be enclosed." The observance of these conditions made the plant when extended less objectionable than before.

Injurious Uses Kept Out of Residence Districts

The following is a list of some of the known purposes for which owners wanted to use property in residence districts but which were kept out by the zoning regulations:

2	milk-bottling stations
3	undertaking establishments
3	filling-stations
3	motor vehicle repair shops
16	public garages
7	laundries
30	stores
1	candy factory

The records also show that in 40 instances property owners intended to erect or change existing buildings to three-deckers in dwelling-house districts where the prevailing development consists of one- and two-family houses.

A milk-bottling station, a large bakery, factories, large garages, and a big ice cream plant were kept out of retail business districts adjacent to residence districts.

Many others doubtless abandoned their intention to do something not permitted by the regulations after the passage of the ordinance, without taking the matter up with the zoning office.

There were a few cases of attempted evasions of the zoning regulations. Without applying for permits, a laundry started operation and an undertaking establishment and three stores in private residences were opened, in residence districts. All of these were compelled to move or close.

Permits for Garages

For several years the City Council, under state law, exercised the power to grant or deny permits for garages for two or more cars. Every month the garage committee of the Council had 25 to 75 applications to pass upon after public hearings. Then the Council had to act upon the report of the garage committee. This method of handling the garage question imposed a heavy burden upon the garage committee and consumed a great deal of the Council's time. On the first of March of this year the state law ceased to control, and permits for garages have been issued, like permits for other buildings and uses, under the zoning ordinance. Those wishing to erect private or public garages in conformity to the regulations provided in the zoning ordinance now secure permits quickly and without the expense or trouble formerly required under the state law. Since March 1, the only garage cases which have come to the Board have been three appeals to permit four-car garages on vacant lots in residence districts.

During the first year the City Council passed two amendments to the zoning plan. One amendment changed the zoning map to extend an industrial district, and one changed the text of the ordinance to require a public garage for more than four cars in local business districts, surrounded by residence districts, to secure a special permit from the Board.

Upholding the Regulations

A property owner on the northeast side started out one evening to secure the signatures of his neighbors to a petition requesting the City Council to change his street from a dwelling-house to a business district so that he could build a commercial building on his lot. The next morning, from nine o'clock to noon, the secretary of the Board of Review was kept busy answering the telephone and reassuring indignant and angry property owners. One owner stated that he had invested $30,000 in a home largely on an assurance of protection against such encroachments, and protested vigorously against any change in his street. This change has not been made, and the petitioner has built dwellings on his property.

The Board of Police Commissioners, which issues licenses for victualing places, dance-halls, pool-rooms, etc., refers all doubtful locations to the zoning office for a report as to whether the use is permitted under the zoning regulations. In this way many such uses have been prevented from becoming established in residence districts. The Chairman of the Board of Police Commissioners recently stated in a public address that the zoning law is the only protection residence districts in Providence have against bootlegging restaurants.

To summarize, the success of zoning in Providence thus far seems to be due to the way it was prepared, the way it has been administered, and the way it has been received by the people generally.

"After a Year of Zoning in Providence, What Do You Think of It?

In response to this question the following statements were submitted:

JOSEPH H. GAINER, Mayor, city of Providence:

After a year's trial in Providence, zoning is now firmly established. It has been successful even beyond our expectations. In my opinion this is due to the careful way in which our zoning districts and regulations were worked out and made to fit our conditions; to the splendid work of the Board of Review; and to the spirit with which the citizens of Providence have accepted the principles of zoning and surrendered their individual privileges for their neighbors' good and for the welfare of the community.

ARTHUR A. THOMAS, Chairman, Ordinance Committee, City Council:

The zoning ordinance passed by the City Council on June 6, 1923, was probably the most important piece of constructive legislation ever enacted by the city. After over a year, it has proved itself an admirable protector of the property interests of our citizens, who have accepted it with excellent grace.

The ordinance is a success beyond measure, and no one has asked for a return to the old days of neighborly unfriendliness.

RICHARD B. WATROUS, General Secretary, Chamber of Commerce:

It has been a source of immense satisfaction to the Chamber of Commerce to be able to say that Providence has a zoning ordinance, and that the regulations are being carefully observed. We have been congratulated time after time upon the wisdom and foresight of our Council in zoning the city in such a complete and effective manner.

JOHN H. CADY, President, Providence Chapter, American Institute of Architects:

The people of Providence have accepted zoning completely, just as they have building code and other police power regulations. No one wants to do away with it, and some of us think it might well be even more stringent in a few of its provisions.

HERBERT C. CALEF, President, Real Estate Exchange:

Zoning has given the public greater confidence in real estate. There is no longer fear of home neighborhoods changing needlessly or of public garages and factories coming in. Home owners now are not forced to buy adjacent lots to protect themselves from cheap tenements.

I have seen no place where any one has been hurt to any extent and a great many places where people have been benefited by zoning.

The real estate men are much pleased with the zoning ordinance.

Satisfying the Craving for Outdoor Life

NO city conditions, however ideal in themselves, supply the craving for real outdoor life—for forests, wild flowers and streams. Human nature demands such simple and wholesome pleasures as come from roaming the woods, from rowing and canoeing and from sports and games that require large areas.

Next in importance to the development of the lake shore possibilities is the acquisition and development of forest spaces. Both the water-front and near-by woodlands should be brought within easy reach of the people, and especially wage-earners.

Natural scenery furnishes contrasting elements to the artificiality of the city. All of us should often run away from the work of men's hands and back into the wilds where mind and body are restored to a normal condition, and we are enabled to take up the burden of life in our crowded streets and endless stretches of buildings with renewed vigor and hopefulness.

Should not the public see to it that everyone may enjoy this change of scene; this restorer of bodily and mental vigor, and will not citizenship be better thereby?

—DANIEL H. BURNHAM.

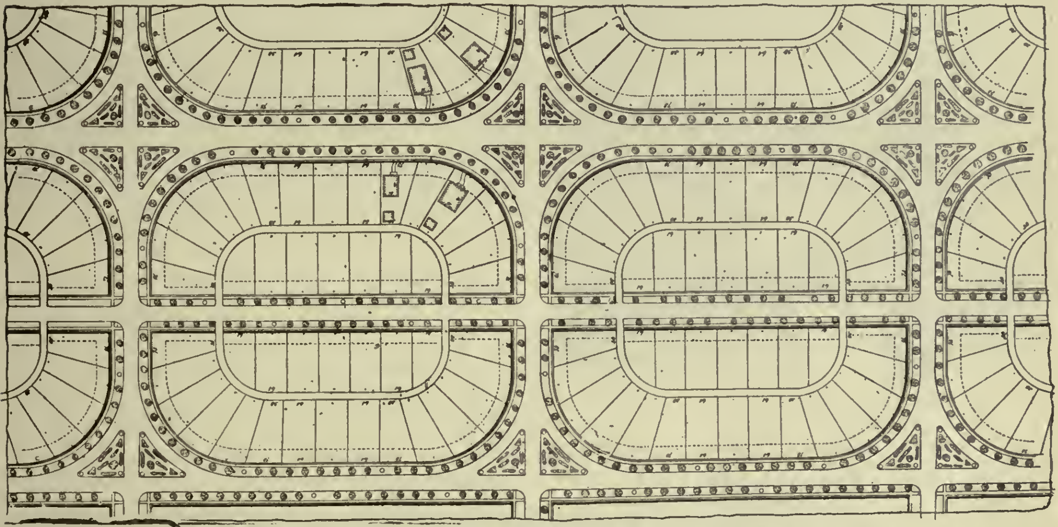
Forward Steps in City and County

New Treatment of Street Intersections for Residential Districts

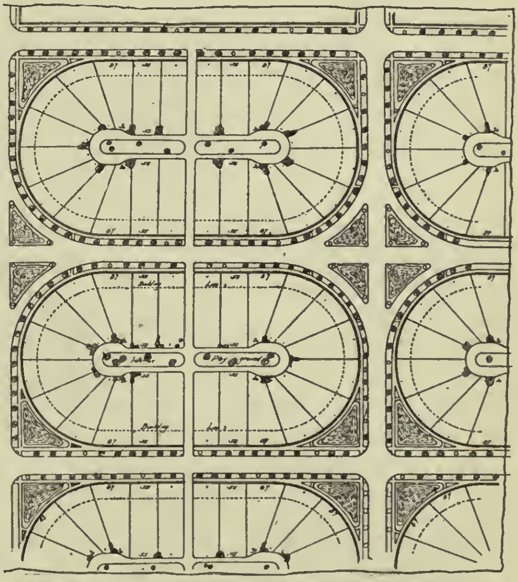
SHOREWOOD, WIS.—Three of the most important problems faced to-day by the subdivider are: the facilitation of traffic, especially at intersections; the utilization of land, to get as much good frontage as possible out of a given area; and the reduction to a minimum of the cost of special underground improvements. The undersigned has evolved a method of planning intersections with these three needs especially in mind.

The principle underlying this idea is that a wide curve at street corners enables traffic to follow along smooth lines of flow, and also to have a long range of vision when approaching the intersection. This new treatment of street intersections also provides opportunity for placing lots so that they front upon the long curve around the corner, instead of fronting on one street and having a side lot line on another street. It provides possibilities for reducing the cost of special underground improvements, by placing them in the rear of the property where the amount of footage to be served is less than the footage served under the present methods.

With an arrangement as shown in the accompanying sketches, the driver of a vehicle approaching an intersection can see for a distance of approximately 400 feet down the cross-street, while he is still about 400 feet from the intersection itself. If he is going to the right, he has a curved roadway of long radius to follow, instead of turning at the ordinary sharp curved corner, thus considerably reducing the possibilities of congestion at the main intersection. On this plan each intersection provides about 300 feet more of frontage than would be found in the ordinary right-angled block. On property valued at $33.33 per front foot, this means an additional revenue of $10,000 for each intersection. It is considered that these lots are more desirable than the ordinary corner lots and that they would bring a better class of improvements, which, in the tax yield, would repay in a short time the extra cost



TYPICAL PLAN OF STREET INTERSECTIONS FOR RESIDENTIAL SECTION
Designed by H. A. Schmitt, Municipal Engineer, Shorewood, Wis. Local conditions to govern width of streets, roadways, lots, etc.



ANOTHER TREATMENT OF STREET INTERSECTIONS SUGGESTED BY MR. SCHMITT of the pavement in the intersection. There is the further advantage that all lots front on the pavement, so that no property owner is compelled to pay both on the front and on the side for pavement and other improvements.

Where it is not necessary to provide such long curves for the traffic, the area of the paved intersection can be greatly reduced; in this case, the property lines would remain about as shown in the first plan, but the curb lines at the corners would be about the same as in ordinary street planning, thus leaving a wide parking between the curb and the sidewalk, as in the lower part of the second plan.

AUTOMATIC ROAD SIGNAL AT DANGEROUS CORNER

A car approaching the corner runs over a narrow steel tread and automatically rings a bell at the danger point and lights a red light for an instant

By placing the underground improvements in the rear of the property, the reduction in their cost can be readily determined by comparing the rear footage to be served in a block under this new method with the frontage of a block of ordinary design having the same length. It will be found that the saving in the improvements is considerable, varying, of course, with the different lengths and widths of blocks encountered that are to be used.

Application has been made for a patent covering this method of intersection design.

H. A. SCHMITT,
Municipal Engineer.

Autos Self-warned at Dangerous Crossing

Asheville, N. C.—At one of the most dangerous corners in this city there has been in continuous operation, day and night, for the past four years, an automatic traffic signal, the efficiency of which is evidenced by the fact that since its installation but one accident has occurred at this point. In that case the driver "saw two posts instead of one."

The device consists of a narrow steel tread laid in the roadway a short distance in advance of a dangerous crossing, so designed that when a car approaches and crosses the tread an electric contact is made, a bell at the crossing or intersection ahead rings, and a red light flashes in a globe on which is printed the word "Look" and an arrow pointing toward the approaching car. This same device may also be installed with an automatic counter which operates similarly to a cash register, recording the exact number of cars passing over the tread. This signal, which was patented in 1917 by Charles E. Lyman of this city,

NO TRAFFIC OFFICER IS REQUIRED AT THIS BAD CORNER IN ASHEVILLE, N. C., BECAUSE THE AUTOMATIC "LOOK" SIGNAL WARNS APPROACHING CARS

EXTERIOR AND INTERIOR OF NEW MEMORIAL CITY AUDITORIUM, AMARILLO, TEX.

has been endorsed by the North Carolina State Highway Commission and is now in use on some of our state highways.

One of the outstanding advantages of this type of signal is the certainty of the warning. It is automatic, and practically fool-proof and weatherproof. The electric switch is water-proof; no springs or oil are necessary; it is self-cleaning, and the tread practically never clogs. If a car is stalled on the tread, the signal stops automatically, ready for the next car. The single-stroke bell used sounds a clear alarm to the person in danger before the approaching car passes the corner. For two-way roads, the machine has been so arranged that vehicles going away from the danger point, where no warning is necessary, pass on silently.

The steel treads used weigh from 400 to 700 pounds, are 5 to 8 feet long, 7 to 15 inches wide, and 4 inches deep. The tread has ⅛-inch play, which is not felt by the passing vehicle. In Asheville the 110-volt current from the city wires is carried through the apparatus without relay or transformer. The use of this current costs the city about $1 a year for 3,000 vehicles daily crossing the tread. For installations of the signal on county highways, batteries may be used.

We have been able to dispense with traffic officers on corners where these signals are in operation, the perfection of the device making any additional traffic regulation unnecessary.

JOHN H. CATHEY,
Mayor.

Memorial Auditorium Serves Many Organizations

AMARILLO, TEX.—The municipal auditorium of Amarillo, erected in 1922 and 1923 at an actual cost of $378,000, stands as a fitting memorial to the soldiers of Amarillo and the Panhandle of Texas who died in the late World War.

The building is divided into four separate wings. The main assembly hall, which has a seating capacity of 2,559 persons, with room for 300 more on the stage, is located in the west wing. It has no overhanging balconies, and the acoustics are excellent. This hall, together with the half-dozen committee rooms and a number of other smaller rooms which have been provided, makes the building an ideal convention headquarters, and since its completion many state and inter-state organizations have taken advantage of its facilities for their meetings. The south wing has been made the headquarters of the Women's Federated Clubs of this city; the American Legion has spacious quarters in the north wing; and municipal offices have been established in the east wing.

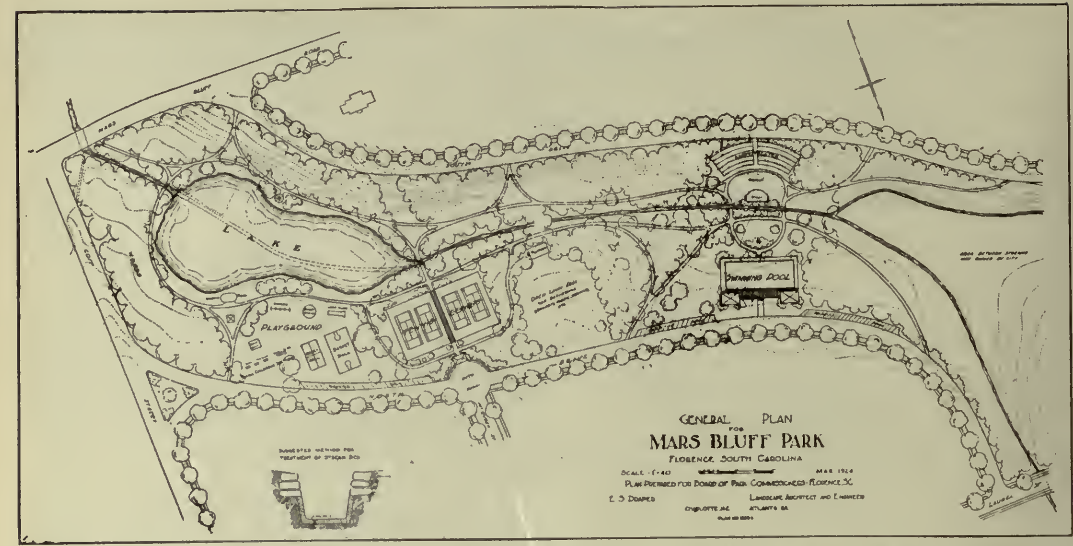
As provided for by city ordinance, the use of the auditorium may be had free of charge for conventions and for any purpose that shall be for the good of the city's taxpayers, if the possible attendance is large enough to require a building of that size and if no person or organization is to receive pecuniary benefit from its use. For the use of the auditorium for all other purposes, a schedule of rates ranging from $50 to $100 has been established.

JEFF D. BARTLETT,
City Manager.

A 25-Acre Park for a City of 10,000

FLORENCE, S. C.—The preliminary work for the completion of the 25-acre park development for this city of 10,000 population, as shown in the accompanying illustration, has been completed according to the plans and under the supervision of E. S. Draper, landscape architect and engineer, of Charlotte, N. C., and Atlanta, Ga., and the park is now in use. Improvements have been made as follows: completed grading of the entire area, together with adjacent park roads; deepening of the stream channel, which will later be paved and further improved; grading of the tennis courts; clearing out of trees and trimming of those trees to be left standing, and seeding of the lawn areas.

This work has made the park usable and will be followed up next spring by the excavation of the lake area, the construction of a dam, a swimming pool and an outdoor theater, and other features of the development. The main features of



the drainage work have already been carried out. In addition to this 25-acre park, the people of Florence already enjoy the use of several neighborhood parks and playgrounds which are being operated under the supervision of Community Service, Inc.

The Park Commission, whose Chairman is one of the officials of the Atlantic Coast Line, has laid out a program of park development and contemplates city planning work which ought to lead to a considerable increase in the recreative facilities of the city. Considerable interest has been shown in Florence in the progress of this work.

B. S. MEEKS,
Chairman, Florence Park Commission.

Park Improvements Without Increased Taxes

ARLINGTON, TEX.—On the evening of May 26 last, Arlington's new municipal park was opened to the public with a fitting ceremony of music, addresses, etc., at which Colonel Alvin Owsley, former Commander of the American Legion, was the principal speaker.

For a number of years the need of a park and playground in this city has been a subject of discussion, but definite action has continuously been postponed on account of the cost and increased tax rates which it was felt would be involved. Finally, the City Commission took up the matter, and after making a thorough investigation, it was decided to float a bond issue of $20,000 for the purchase of a natural grove of forty acres lying along the creek adjoining the city limits, and the construction of a swimming pool, bath-houses, stage, band-stand, tennis court, croquet ground, etc. These bonds were issued, and a landscape architect was engaged to draw up the plans, all work to be carried out under his supervision. The actual work on the grounds was commenced early in March this year, and since that time a great deal has been accomplished. It is estimated, however, that it will require several years to complete the program of development as now laid out.

The swimming pool is egg-shaped, holds 280,000 gallons of water, and will accommodate several hundred people. The local Rotary Club and other organizations have donated seats, playground apparatus and other equipment, and arrangements have been made for band concerts to be given in the park on two evenings each week during the summer, as well as other special entertainments. The concessions already sold for this season are sufficient to pay the interest on the bond issue, and the swimming pool charges of 10 cents for children and 20 cents for adults will be ample to take care of the sinking fund and up-keep. Thus it has not been necessary to make any increase in tax rates for park purposes. Next year it is expected that the income from concessions will be more than enough to pay the interest on the bonds, and the surplus will be used for the purchase of additional improvements.

The fact that Arlington is situated only fifteen miles from both Dallas and Fort Worth, with fine concrete highways and the Interurban Railway affording easy access to these cities, will no doubt increase the number of people taking advantage of the new park and swimming pool. That it will also be enjoyed by many from near-by smaller towns is evident from the requests that have already been received from these communities for the use of the grounds for picnics and other gatherings.

ARCH FULKERSON,
City Secretary.

Slogans for Automobilists

The following are credited to a fifteen-year-old girl of Detroit:

Drive right and more pedestrians will be left.
Watch your step on it.
Taking the other fellow's dust is better than "to dust returneth."
Six feet have awaited many a driver who wouldn't give an inch.
Just because you see its tracks is no sign that a train has just passed.

City Manager Charters Analyzed

Part II: Manager—Administrative Departments—Selection of Administrative Officers—Popular Control—Geographical Influence

By Wylie Kilpatrick

Director, Hoboken Bureau of Municipal Research

Manager

THE position of manager to-day is inconsistent with the role of political leader; the terms are contradictory. Yet occasionally we find charter-framers attempting to accord him that function. Two cities (Denton, Texas; Clarksburg, W. Va.) make the manager also the mayor. The manager is referred to as the official head of the city, and the mayoralty powers are conferred upon him by four charters.[3] By eighteen charters the manager is named as the chief executive, and by thirteen as the executive head. These provisions undoubtedly modify the genuine manager plan. They are chiefly of value as indicating that the instinctive desire of an electorate for leadership is expressing itself illogically when no adequate channel is provided by the governmental machinery.

Essentially, the manager is the administrative head of the city. One hundred and two charters expressly refer to him by this term. The reference no doubt is unnecessary legally, but is valuable to popularly emphasize the exact nature of his status. The charter analysis reveals certain powers of the manager inherent in the nature of his position and implied by the adoption of the charter. Dr. Crane summarizes the basic managerial power as the duty to:

1. Enforce all laws and ordinances
2. Supervise administration, sometimes expressed as the power of active control of all departments and officers
3. Appoint all heads of departments and other administrative officers
4. Remove his appointees at will

Although specific powers granted to the manager differ widely, they all are expressions of duties naturally devolving upon the administrative head of the city. For example, 102 charters confer upon him the duty of preparing the budget. The duty of purchasing supplies and making contracts is named by 26 cities, while 17 give him direct control of public utilities.

As the administrative agent of the council, the appointment of the manager by that body naturally follows. Only two cases are revealed by the analysis which provide for another mode of selection. In Grand Haven, Mich., and Charlestown, W. Va., he is appointed by the mayor with the approval of the council. Almost uniformily, the charters specify that he holds employment at the council's pleasure. Eighteen cities do modify the indefinite tenure by specifying a definite term for the manager, or permitting the council, if it so desires, to contract with the manager for a period of years. This impingement upon the council's power of removal may in practice seriously interfere with its control over executive policy. A more illogical and unjustifiable deviation from the manager plan is the provision in seven charters making the manager subject to recall by the people.[4] To subject the manager to constant flank attack through the threat of recall is to cut the line of his accountability to the council.

What qualifications for the managership do charter-framers have in view? Certainly, the actual choice by the council establishes a measure of practice more important than legal expressions. The frequent requirements of competence and ability gain or lose value with the council's action. In a few instances the true status of the manager is directly perverted. Seven charters require that the manager be a voter of the city or a resident at the time of his appointment; two stipulate that he must be a resident of the state. Another infringement upon the council's choice is the requirement in seven charters that the manager be an engineer, compliance being compulsory in four and optional in three cities. The far greater number view the manager's residence at the time of appointment as immaterial. One hundred charters include a swearing-off resolution that the manager need not be a resident of the city, and one that he shall not be.

Charter provisions outlining the departmental organization are not immutable. Rather, the majority of charters outline a tentative organization subject to alteration by the council. This flexibility is necessary to permit the adaptation of the governmental mechanism to changed conditions, even though it makes possible the tangling of the organization scheme among a medley of ordinances.

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[3] San Jose, Calif.; Hickory, N. C.; High Point, N. C.; Morgantown, N. C.

[4] Long Beach, Calif.; Durango, Colo.; Montrose, Colo.; West Palm Beach, Fla.; Grand Haven, Mich.; Dayton, Ohio; Wheeling, W. Va.

Administrative Departments

One hundred charters specify the departments into which administration should be divided, the number ranging from one to ten. The scale reaches its height about in the middle, where five is the number favored by thirty-one cities; the second choice, three departments, is followed by only fourteen cities; the third, four departments, has thirteen cities; the fourth rank is tied by the single- and six-department plan, each being established in twelve cities.

Among the various provisions for organization, the only approach to uniformity is the charters with five departments. Eighteen of them have the five departments of finance, safety, service, law, and welfare. The first four are combined with another department by two other charters, and the first three with two others by six charters.[5]

No generalization as to a particular departmental organization can be drawn from the various plans. An approach to a norm, however, can be made by considering the five standard departments, outlined below. The scheme may be adapted to local needs by delegating any indicated function of a division to a separate department:

- Finance
  - Audit and Accounts
  - Treasury
  - Assessments
  - Purchasing
- Safety
  - Police
  - Fire
  - Building Inspection
- Service
  - Engineering
  - Utilities—Water, Electric Light
  - Streets
  - Sewers
  - Property
  - Harbor
- Welfare
  - Health-Sanitation
  - Parks
  - Cemeteries
  - Playgrounds

Selection of Administrative Officers

To the manager, the chief of the administrative service, must naturally be entrusted the selection of administrative officers. Manager charters, with occasional exceptions, adhere to this principle. The analysis reveals only 62 of popular election, and half are found in one state, Virginia. Doubt as to placing the treasurer, the chief police officer, and the auditor under the manager is most frequent, the first being popularly elected in 22 cities, the second in 13, and the last in 10. Provisions for appointment by the council are more numerous. In one-half the cities the attorney is selected by that body; two-thirds appoint the clerk; one-third the treasurer; one-quarter the assessor. The appointive power of the mayor is retained in a few instances where he names the assessor, clerk, treasurer, or attorney.

The divergence of practice in substituting an appointing power for the manager is illuminating. If practice found the centering of all administrative officers under the manager unworkable, uniformity in selecting particular officers by the council or electorates would develop. In fact, uniformity is not even approached in the various exemptions from the manager's control. Haphazardly, cities have picked on one or two officers for selection by the council or the voters. Apparently the charter framers in some instances are not reconciled to placing all appointive power in one officer and wish to hang a fringe of that power on some other body regardless of its logical place. To this must be made two exceptions. In nearly all instances, education is a separate department not responsible to any administrative head. The logical selection of the city clerk is by the council, which he serves as secretary.

Popular Control

The theory of checks and balances is in itself justifiable. But the check must be, not of one official against another, but of a responsible official against a people who can hold him accountable; the balance must be, not of departments separated on artificial lines, but popular wish and decision against official act and execution. The manager plan makes it known to the voter whom to hold accountable for the conduct of the city's affairs. The alibi of divided responsibility can never be pleaded when a citizen votes for councilmen who formulate all policy and are responsible for all administration.

In lieu of the check of one official against another is the more complete check of responsible officers provided by the initiative, referendum, and recall. These devices, while hardly essential to the manager plan, do tune up officers to the popular will. One or all three measures are provided in all but 25 of the charters. One hundred and nine of the 167 charters provide the voters with all three of the checks. Nine charters contain only the initiative and recall, two the initiative and referendum, and one the referendum and recall only.

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[5] The number of charters in which particular departments appear are as follows: 60, Finance; 56, Service; 44, Safety; 36, Law; 32, Fire; 27, Police; 23, Health; 22, Welfare; 12, Education; 10, Utilities; 6, Public Affairs; 5, Water; 5, Treasury; 4, Parks; 3, Purchasing; 2, Records; 2, Inspection; 2, Assessments; 2, Engineering; 1, Property; 1, Library; 1, Harbors; 1, Electric Light; 1, Cemeteries; 1, Sanitation; 1, Industrial Affairs.

Geographical Influence

That political theories and practices prevailing in certain sections of the country should be reflected in the charters is to be expected. The movement for the initiative, referendum, and recall leaves its imprint in this fashion in manager charters. The western and southern states usually provide for these devices of popular control. California—long the "bad boy" of state governments—has not failed to include all three measures in her ten charters. Texas and Florida in the South give almost complete adherence to these checks. Northern states, as Ohio and Michigan, which were forerunners in adopting them for the state government, likewise include them in manager charters.

The grafting of the city manager plan upon older forms may be traced geographically. Normally, the hybrid "commission-manager" is found in areas accustomed to commission government. Equally interesting is the influence of the town meeting plan in New England. Four Massachusetts charters provide for electing the council by the town meeting.

The property requirement for membership on the council, found in 27 charters, crops out in seemingly illogical places Oklahoma admits of a radical state constitution, and Oklahoma has nine charters with a property qualification. Four of the eleven manager cities of Kansas contain this provision. None of the New England charters make a property requirement.

The spread of the plan itself is on a progressive ratio of acquaintance. The areas in which the plan is first started form the territory through which it expands. California, already a stronghold of the movement, recently added nine manager charters to her list, and a half-dozen more Florida cities swung into line last year.

The adoption of the managerial charter in all parts of the country frees it from any suspicion that it is a sectional development. Its extension into larger cities shows that it is not essentially a small-town form of government. Many innovations in governmental machinery, as the initiative, referendum, recall, and the direct primary, hardly have the vogue to-day that they had before the war. Significantly, the growth of the manager plan, unlike many reform movements, has not been slowed up by the post-war reaction. Unless a second Galveston flood occurs or the Miami River again rises, alterations in the charters of American cities during the next decade will largely follow the structure developed by the eleven-year clinic, just ended, of the city manager plan in operation.

The Public Library—An Agency for Civic Progress

THE following questionnaire, based upon a statement issued by the Ohio State Library, is offered by the American Library Association for special study in American Education Week, Nov. 17 to 23, 1924.

Community Service
- Does your library have branches or service stations for outlying districts?
- Are all elements in the community reached? Business men, foreigners, factory girls?
- Is the library used by 30 per cent of the population, a reasonable minimum?
- Is the annual circulation of books 5 times the population of the city?

Children's Work (building for the future)
- Is there a children's librarian with special training?
- A special reading-room with low tables and shelves?
- A well-selected, adequate collection of children's books?
- Is work correlated with that of schools?

Adult Education
- Does your library make an organized effort to aid men and women and boys and girls out of school in planning courses of reading for self-education?

Book Stock
- Is collection adapted to the interests of the community?
- Is it kept up by frequent buying?

Quarters
- Is library centrally situated? In good repair? Clean? Attractive?
- Are reading-room and book space adequate?

Staff
- Is service gladly or grudgingly given?
- Have librarian and assistants had as much general education as teachers must have?
- What professional library training have they had?
- Are salaries sufficient for good service?
- Are they comparable with school salaries?

Income
- Does tax levy average $1 per capita, a reasonable standard?
- Is there other revenue?

Government
- Who are your library trustees?
- Are they interested in library progress?

Sources of Information
- Your librarian and trustees
- Your State Library or Library Commission (for laws, standards, comparisons)

Bituminous Pavements in Wellington, New Zealand

By K. E. Luke

Inspecting Engineer, Wellington, N. Z.

WELLINGTON claims to be the first local body in New Zealand to construct asphaltic concrete pavements with residual asphalt. Its paving developments have been watched with considerable interest by all local bodies throughout New Zealand. The late City Engineer, W. H. Morton, after a world's tour in 1919, recommended to the Wellington City Council the adoption of the asphaltic concrete type of pavement. During 1922 and 1923 some 32,000 square yards of pavement of various thicknesses were laid on certain city streets. These pavements were constructed on existing macadam surfaces and consisted either of a 2-inch black base with a 1½-inch top course and seal coat, or a 3-inch black base with 2-inch top course and seal coat, according to the class of traffic using these streets.

Since the time of construction not one penny has been spent on maintenance costs. The whole of the material for this work was handled by a small tar macadam mixing plant converted for dealing with the finer materials required for hot mix bituminous paving. This type of paving was giving so much satisfaction that in July, 1923, a large Cummer paving plant was imported from America, and paving operations with this machine were commenced on December 22, 1923.

For many years past the only arterial road into Wellington from the north had given the neighboring local bodies and the Wellington City Council considerable trouble owing to the extremely heavy maintenance cost of the macadam surface. This 100-foot roadway, known as the Hutt Road, is 5¼ miles long and carries a traffic varying from ordinary touring cars to heavy industrial vehicles at an average of 200 per hour.

Public tenders were called for in August, 1923, for the construction of a 24-foot asphalt pavement in the center of this roadway for the full 5¼ miles. Owing to the fact that

BUILDING ONE OF THE NEW ASPHALT ROADS IN WELLINGTON, NEW ZEALAND
This picture shows the Cummer paving plant located at the midpoint of the pavement and one and a half miles from the quarries

LAYING THE BLACK BASE FOUNDATION OF A NEW ASPHALT ROAD IN WELLINGTON, NEW ZEALAND

the Paving Department already had a paving plant in order, instructions were given that the Department should submit a tender with the public tenders. The lowest tender submitted was by the Department at 10 shillings per square yard, the highest tender reaching 14 shillings per square yard. The Department's tender was accepted.

The pavement as constructed consists of a total width of 24 feet of a total thickness of 4½ inches. The construction was of two-course thickness, consisting of a 2½-inch black base course and a 2-inch top course with a final seal coat treatment of asphaltum and quarry chips. The pavement was laid in the center of the roadway, leaving a macadam surface on each side for slow-moving traffic. The edges of the pavement are not protected, but the macadam surface is backed up against the pavement except where this roadway passes through two small townships. These two areas of the pavement are edged with concrete curbing. The graded aggregate used in the base course consisted of quarry crushed metal graded from ¾-inch down to ¼-inch metal with graded sand. The top course aggregate consisted of ½-inch metal graded to 8-mesh metal with graded sand and filler.

Paving operations commenced on December 22, 1923, and the work was completed on May 22, 1924. Allowing for certain wet weather and holidays when paving work was not carried out, the total area of 78,728 square yards of pavement was constructed in 110 working days, an average of over 700 square yards of pavement 4½ inches thick per day.

The actual cost of the pavement was 12 shillings, 6½ pence per square yard, while the cost of building up the haunches against the edges, and all overhead charges, brought the total cost to 9 shillings, 8½ pence per square yard, or 3½ pence per square yard lower than the tendered price of 10 shillings per square yard. The pavement was put down on the existing macadam surface, with the exception of certain stretches when regrading was necessary. This pavement, after carrying the traffic for the last three months, has a splendid appearance and, needless to say, there has been no maintenance cost to date. The successful completion of the work has brought together representatives of all adjacent local bodies and a paving scheme of some 36 miles of pavement has been proposed, and there is every indication that this paving program will be put into effect.

WOMAN SUCCEEDS HER HUSBAND AS MAYOR

Wilmington, N. C., has the distinction of being the first municipality in North Carolina to appoint a woman as mayor, Mrs. Catherine Cowan having been chosen by the City Commissioners to succeed her husband, James S. Cowan, late Mayor of Wilmington, who died recently. Mrs. Cowan will serve for the duration of her husband's unexpired term, ending in June, 1925.

A STREET IN GHENT, BELGIUM

The Government of Belgian Municipalities

Uniformity Combined with Flexibility of Initiative

By Thomas Harrison Reed
Professor of Political Science, University of Michigan

THE condition of real political freedom among people is the possession of sound and active institutions of local self-government. Democracy on a large scale can only function through organization so elaborate as to afford little opportunity for the expression of the individual will. In a great modern state, democracy necessarily acts spasmodically and indirectly, while in the local affairs of small units it acts much more constantly and directly—in other words, more really lives. To concentrate the direction of all matters in the hands of the central authorities not only destroys local political life but makes national political life more complex and difficult. Hence Lammenais' celebrated phrase, "Centralization is apoplexy at the center and paralysis at the extremities." Happily, Belgium possesses autonomous local institutions of great vitality. It is not merely that the provinces and communes have by law a somewhat larger competence and greater freedom from administrative interference than the departments and communes of France. The significant fact is that they have an ancient and living tradition of self-government which is lacking in the corresponding French units, and practice an independence which quite outruns the limitations of the law.

The Communes and Their Powers

The 2,630 communes which cover the whole territory of Belgium are no more or less than its historic communities. Their boundaries are irregular, and they differ vastly in extent and population. They are all, however, governed in accordance with a single law. This principle of uniformity is characteristic of European municipal legislation. At first sight it may appear to the American reader unreasonable to provide one frame of government for a Limbourg village of three hundred inhabitants and for Antwerp with as many thousands. As a matter of fact, however, the law does not enter into the details of municipal organization; the number of councilors and échevins and the salaries of the principal officers are made to vary with the population, while power is given to each communal council "to regulate all that which is of communal interest," subject in certain cases to the approval of the Permanent Deputation.* Flexibility and scope for municipal initiative far greater than that enjoyed by most American cities are thus secured to even the smallest Belgian commune, at the same time that the public is amply safeguarded against their abuse. At its best this system may well be superior to the Anglo-American method of controlling local authorities by the minute prescriptions of the legislature, somewhat negatively enforced by the courts. Of course the merit of the system in practice depends upon the spirit in which the central and provincial authorities exercise their powers of supervision. There is ample testimony that in Belgium this spirit is a liberal one. The communes have been allowed to use the widest discretion in the exercise of their powers.

The Communal Council

Each commune possesses a representative legislative body—the Communal Council—varying from nine to forty-five members according to population, except that Brussels has had, since the annexations of 1921, fifty members. They are all elected once in six years on a general ticket for the whole commune, except, again, in the case of Brussels, where thirty-nine are chosen from the old city and eleven from the annexed territory. In these communal elections women vote on the same terms as men. To be elected, one must be twenty-five years of age and a resident of the commune. In communes of less than 700 population, however, one-third of the council may be non-residents. The number of signatures required for nomination varies from 5 in communes having 500 inhabitants or less, to 100 in communes having 20,000 or more. In general, the machinery of elections is the same as that for national elections, except that the system of proportional representation differs in certain important details.

The Council has jurisdiction over everything of communal interest . . . and is left free to determine its own competence, provided it violates no law in so doing. The powers of the Council embrace all the ordinary functions of a municipality, such as the administration of communal property, the maintenance of streets, parks, and sewers, poor relief, public health, and all sorts of kindred services, transportation, markets, fairs, and slaughter-houses. In fact, there is almost no limit to the services which a commune may establish for the benefit of its inhabitants. Water, gas and electricity are commonly supplied by municipal enterprise. Only a careful study of the official reports of the communes can give an adequate idea of the extent and variety of their activities. Cemeteries, museums of all kinds, libraries, baths, washhouses, abattoirs, theaters, opera houses, public lecture courses, pawnshops, information bureaus for tourists, bill-posting services, canals, docks, are some of them. One city, Liége, has a municipal tramway system. Primary education is a function which the commune must supply by establishing or adopting schools. In addition, many of the larger communes have established middle and vocational schools, the number and scope of the latter being in some instances truly remarkable.

With regard to all the foregoing matters the Communal Council plays the same part as the Parliament in national affairs. It settles the policy of the commune, votes the annual budget and all loans and taxes, and makes such regulations as are necessary to carry on the communal administration. Furthermore, it possesses the power, always accorded to American city councils, but which in France belongs to the *maire,* of adopting police regulations. These must not be contrary to the laws and regulations of the general or provincial administration. They relate especially to the preservation of order, cleanliness, and safety in streets and other public places, including cafés and theaters; the use of proper weights and measures, the cleanliness of food products offered for sale, the prevention and mitigation of public calamities, such as fires, epidemics, etc., the restraint of insane persons and ferocious animals. Penalties for the violation of communal regulations are enforced by the tribunal of simple police and may consist of one to seven days in prison or one to twenty-five francs fine or both. The Council is also charged with certain duties essentially executive in their nature, such as accepting or refusing gifts or bequests, and the appointment, discipline and removal of communal officers, in so far as the latter power has not been delegated to the échevinal college.

The Burgomaster and Echevins

The burgomaster (*bourgmestre*) is appointed for six years, nominally by the king, from among the members of the Municipal Council. He may, however, with the advice of the Permanent Deputation, be chosen among the citizens of the commune who are twenty five years of age or more. As a matter of practice, however, the central authorities are not entirely free in their choice of burgomasters. In the first place, reappointment is the rule. Secondly, it frequently happens that some member of the Communal Council occupies a position of such prestige and influence that the government cannot ignore his claims. For example, Burgomaster Max of Brussels, fresh from his German prison, to which devotion to the rights of his people had condemned him, was an inevitable choice. In the selection of a new burgomaster it is the custom to consult officially the Communal Council, and its nominee is usually promptly appointed. There have been in years gone by some marked exceptions to this rule, especially in the case of councils with Socialist majorities. Where, as is often the case nowadays, the Council is divided between the three parties, with a majority for none, the government may play a decisive role in the choice of a burgomaster. The respect for local sentiment, however, is such that when it has been unmistakably expressed, the central authorities lend it an attentive ear.

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*A body of six members, to be found in each of the nine provinces of Belgium, chosen by the Provincial Council from among its own number and having many and diverse functions.

The échevins are elected for six years by the Council from its own number. Their number varies with the population:

2 in communes of less than 10,000
3 in communes of 10,000 to 20,000
4 in communes of 20,000 to 50,000
5 in communes of 50,000 to 150,000
6 in communes of more than 150,000

The burgomaster and échevins are paid salaries fixed by the Permanent Deputation on the motion of the Communal Council. In the larger communes these salaries are, judged by Belgian standards, considerable. Women are eligible for the positions of burgomaster and échevin, but if married must have their husbands' consent.

The executive authority of the commune as a unit of local self-government is vested in the college of burgomaster and échevins. In law the powers belong to the body as such. The larger cities, however, have found it necessary to apportion the task of supervising the services of the city among the members. The burgomaster presides over the deliberations of the college and in case of tie his voice may be decisive. Aside from this, his legal authority is no greater than that of any other member. He is, however, generally the most influential member of the college and council, if not of the community. In the smaller places he is apt to be the undisputed leader of the communal government. In the larger communes the individual échevins have the advantage of an independent sphere of duty. On the other hand, the burgomasters of the great cities are to be reckoned among the most influential men of the kingdom. They are often members of the Chamber of Representatives and play leading parts on the stage of national politics. The burgomaster's position is further strengthened by the fact that one field of municipal administration is reserved exclusively for him. The Communal Law charges him alone with the duty, usually assigned to the mayor of an American city, of carrying out all the laws and decrees of the central and provincial governments, except those laws the enforcement of which is specifically attributed to the college or the Council. In addition he is specifically charged with the execution of police laws and regulations. He commands the officers and agents of the communal police. He may, as a measure of discipline, suspend them, even when, as in the case of the commissaire, the power of appointment and removal belongs to the Crown, or, as in the case of assistant commissaires, to the Council. The Council has no authority over him even in the execution of its own police regulations. In time of emergency he can make temporary regulations valid until the next meeting of the Council. He alone of all city officials can call for the assistance of the military.

The Use of Unpaid Commissions

Very wide use is made in Belgian cities of the gratuitous service of public-spirited citizens in the management of numerous undertakings, especially for poor relief, hospitals, vocational schools, theaters, orchestras, etc. We may take the administration of institutional and other charities of Brussels as a well-developed example of this method of administration. Several large hospitals and many other charitable activities of the capital are grouped under the control of a general council of ten members appointed by the Communal Council from two double lists of candidates submitted by the general council itself and the échevins. The term is five years. The Communal Council controls its appointees by the adoption of a detailed budget, but otherwise leaves them rather a free hand. Its power of approving appointments is exercised only in the case of the "receiver," who handles large sums of money. The supervision which the échevins might exercise is rarely, if ever, attempted. The general council has no executive head. It appoints a secretary who is the intermediary between it and all subordinate branches of the administration. It meets twice a week from January to April and once a week from May to December. The volume of business to be transacted is enormous.

Professor Errera describes the secretary as the "polebolt" of the administration. He is appointed, suspended or removed by the Communal Council, subject to the approval of the Permanent Deputation. His functions are not unlike the combined duties of an American city clerk and a city attorney. He is in most of the larger communes a member of the legal profession. In the smaller villages the place frequently falls to the schoolmaster. It is in these smaller communes, where a burgomaster little acquainted with administration is in need of a guide, that his power is relatively greatest. In the larger communes, however, he is often a man of great distinction. He never, of course, bulks quite so large as the English town clerk, who owes his extreme importance to the absence of any general executive authority outside the Council itself.

There is also in each commune a receiver appointed by the Council. He is at once collector, treasurer and controller. There are in many communes commissaires of police appointed by the Crown from a list of two names submitted by the Communal Council, to which list the burgomaster may add one. These officers—there may be several in a large city—have important executive police duties. They are also charged with the representation of public interests as prosecutors before tribunals of simple police, and with the preliminary investigation of persons accused of crime.

What Are the Results?

Such superficial observation as a stranger can make in a few months' sojourn does not lead to superlative praise of city administration. It is generally reputed to be honest, except in so far as the *quid pro quos* of politics are dishonesty. There is a tendency to the multiplication of functionaries and red tape. A simple *permit de séjour* may be forthcoming only weeks or even months after the law-abiding foreigner has applied for it. Refuse collection is the same untidy affair as it is most often in America. Traffic runs wild in the streets and only the small number of automotive vehicles prevents a general massacre. The streets, however, most of which are paved with stone blocks, are kept tolerably clean by hand-broom methods. Their fire departments, much inferior in personnel and equipment to ours, are adequate to the small number of fires. The public health service, which the stranger does not see at all, offers through its magnificent vital statistics the strongest possible evidence of efficiency—a low death-rate. The death-rate per 1,000 in Brussels for 1920 was 13, and the average of the communes of Greater Brussels was 13.3, and in one of the largest, Saint Gilles, fell below 9. The communal business enterprises generally show a profit, after allowing for amortization, depreciation, etc., but after also making a liberal charge for the water, gas, electricity, etc., used by the commune itself. Streets are well lighted, the great thoroughfares by electricity, minor streets by gas. Life and property are safe. While Belgian city government is never as bad as American city government at its worst, and while it almost always excels in the variety of its services to the public, the vigor and success with which the citizens prosecute the essential work of a city government can scarcely be said to equal the best American examples.

HOTEL DE VILLE (TOWN HALL), BRUSSELS, BELGIUM
Erected in 1402

ACKNOWLEDGMENT.—The foregoing paragraphs are reprinted by permission from Professor Reed's new book on "Government and Politics in Belgium," published by the World Book Company, Yonkers-on-Hudson, N. Y. The book is reviewed briefly in the department of Municipal and Civic Publications, page 449 of the April, 1924, issue of THE AMERICAN CITY.

Snow Removal on Highways

Organization, Methods and Equipment

By Edward E. Reed
Assistant State Highway Engineer of New Jersey

SNOW-REMOVAL work in New Jersey was first considered in the winter of 1917-1918, when this country was at war. The purpose at that time was to keep certain roads open to traffic so as not to interfere with the truck convoys going from inland points to the seaboard for shipment to France. There was very little snow during that year and very little was accomplished. Some work was done on a small scale during the winter of 1918-1919 and the winter of 1919-1920. The real organization was first effected in the winter of 1920-1921, and last winter made the fourth year for this intensive work in New Jersey.

The state comprises an area of 8,224 square miles and a population of 3,155,900. While it is a small state, it is thickly populated and its roads form important connecting links between New York and Philadelphia. In addition, the state is primarily a manufacturing or industrial state, and considerable truck traffic passes over its highways. The total highway mileage exclusive of city and borough streets is 17,120. The state highway system comprises 726 miles, or less than 5 per cent of the total highway mileage in the state. The roads in this system, however, are important interstate and intrastate routes. Motor truck transportation is carried on over these roads during the winter and summer. It was therefore considered necessary in rendering proper highway service to the public that these highways should be kept open at all times so that the loads could be moved with regularity and as economically as possible. With this in mind, the snow-removal organization was developed.

Organization for Snow Removal

The organization is divided into two general headings, the Office and Field Forces. The Office Force consists of a day and night force, each being on duty for 12 hours if necessary, and is subdivided into representatives of the Administration, Maintenance and Equipment Divisions. The duties of the representatives of the Administration Division are to provide telephone service, elevator service, and heat during the "wee sma' hours" when there is usually not much of this available. The representatives of the Maintenance and Equipment Divisions keep in touch with their forces in the fields.

It is the duty of the Office Force to keep in constant touch with the United States Weather Bureau for advance information of the approach of heavy storms. New Jersey, however, is situated in that latitude where it is difficult to tell in advance whether a storm will bring rain or snow. To overcome this feature, our Field Forces telephone to the Central Of-

A SCENE ON NEW JERSEY STATE HIGHWAY NO. 1, NEAR ROBBINSVILLE, SHOWING THE DRIFTS WHICH WERE LATER COMPLETELY REMOVED BY STATE EQUIPMENT

NEW JERSEY STATE HIGHWAY NO. 1 AT HAMILTON SQUARE, SHOWING COMPLETENESS OF SNOW REMOVAL

fice if it begins snowing before they hear from headquarters. The office organization is immediately assembled and contact is made with the different sections of the state in order to determine the extent of the storm.

The Field Forces are subdivided into the contractors' forces, State Highway Maintenance Forces and State Highway Equipment Forces. For snow-removal work the state highways are divided into sections approximately 12 miles in length. For last year there were 59 such sections, 47 of which were assigned to contractors and 12 handled by Maintenance Forces.

A map is prepared showing the sections which are to be opened by contractors' forces and the Maintenance Forces, the name of each contractor appearing on these sections. After these sections have been assigned, a conference is held between the contractors to discuss rates of pay and methods of operation which have come up in previous years, to govern which it is necessary to adopt rules and regulations that will be agreeable to both the contractors and the Highway Department.

A questionnaire is prepared and forwarded to each contractor, giving the number of the state highway route and the terminal points of his section, and the numbers of the trucks assigned to him. He returns this questionnaire, giving the correct name of the company, the name of his superintendent, and the telephone numbers of the garage where the trucks are stored and where his representatives may be reached at any time of the day or night, Sunday or holidays. A chart is made giving all of this information for ready reference.

The equipment used on the contractors' sections consists of trucks received from the Federal Government from war surplus material. These trucks are used by the Maintenance Forces for repair and maintenance work. When this work is completed, they are sent to the Fernwood service station, which is a large garage and machine shop located near Trenton, where they are thoroughly overhauled and put in good condition for snow-removal work. The scraper blades or snow-plows are attached and these trucks are forwarded to garages in different parts of the state located at points convenient to the different sections. The garages are selected by the contractors and representatives of the Highway Department. ,

There are three trucks assigned to each section. They are Nash Quads, Macks, Rikers, Heavy Aviations, F. W. D.'s and Packards. The equipment is kept in heated storage with the snow-plows attached and the trucks are filled with ballast and jacked up to relieve the springs of the weight. This is done so that there will be no delay in getting out on the work when the snow call is issued.

The contractor is required to have three men on each truck, two drivers and one helper. This is necessary because when they start out in a storm, they may have to be out 16 or 24 hours, and this is entirely too long a shift for one man to serve without relief. With the men on the truck, there is always relief available without holding up the equipment for one of the crew. The contractor has a superintendent in charge of this work, and the men he employs are usually the men that he keeps during the winter in order to hold his organization together.

The twelve sections handled by Maintenance Forces are generally gravel roads that have not yet been reconstructed, and the equipment which is used for gravel maintenance work is used for snow-removal purposes. This consists of a 3- or 5-ton crawler tractor and scrapers on each section.

In addition to the contractor's forces, the Maintenance Division assigns one of its foremen to each section. The duties of the maintenance foreman are to assist the contractor and cooperate with him to open the road as soon as possible. He also keeps in touch by telephone with the Trenton office and advises of the progress being made by the Field Forces. The Equipment Division also assigns a mechanic to each of the contractors' sections and Maintenance Division sections. The duties of the mechanic are to see that the equipment is kept in proper working order and to make any adjustments or repairs in order to keep it in constant use.

When the Snow Call Comes

This entire organization is handled from the Trenton office. If the information received from the United States Weather Bureau is of a definite nature, a snow call is issued. If no information is obtained from the Weather Bureau in advance of a snow-storm, field representatives keep in touch with headquarters if it begins snowing. If it is apparent that the snow will result in a fall of 2 inches or more, a snow call is issued and the contractor is notified to call his organization together at the garage where the trucks are stored for his section.

A record is made in the Trenton office of the time of this call. The contractor then calls back when his organization is together, but he is not authorized to go out on the road until we are satisfied that the snow is of such a depth as to warrant removal.

The three trucks travel together up one side of the road in echelon, pushing the snow out to the side as far as possible. A trip is made to the end of the section, and then a return trip is made on the other half of the road in the same manner. The purpose is to push the snow back far enough so that subsequent snows will not restrict traffic to less than two lanes.

It is absolutely necessary to call out the organization and have it ready so that the snow can be removed when approximately 2 inches in depth and have the outfits continue removing the snow throughout the storm. It would not be effective if we were to wait until the snow had stopped before starting out.

When the outfits have cleared the road, a representative calls the Trenton office and reports this fact. He is then authorized to disband his forces, or if we have information of the approach of another storm, he is told to hold his forces in readiness. When an outfit is finally called off, a record is made in the office so that when bills are presented they can be checked with this record. A contractor presents his bills for snow-removal work after each storm.

This work done by the contractors is not done by contract but by force account, and the rates paid are previously agreed to by the Highway Department and the contractors. The bills for the monthly storage for the trucks, which range from $10 to $20 per month per truck, are paid directly by the State Highway Department to the garage owner on presentation of the bills in proper form. No hand shovelers are permitted without first having the request O. K.'d by the Trenton office, and these are used only in cases of emergency where blizzards are encountered. Maintenance Forces open the drainage ditches and structures as part of their regular duties after the road is opened.

In addition to the equipment mentioned above, for general emergency purposes we have six 10-ton crawler tractors equipped with V-type locomotive plows stationed at certain strategic points throughout the state.

During the winter of 1922-1923 snow fell on 44 different occasions. On 16 of these occasions it was necessary to do snow-removal work. Twenty-two, or just one-half, were recorded as traces, that is less than 1/10 of an inch fell and snow-removal work was not necessary.

The depth of the snowfall varied in different parts of the state. In the northern part, such as Sussex County, the total snowfall was 61 inches. The last snowfall recorded was 15.7 inches at Sandy Hook. The average total for the entire state was 44.7 inches.

The length of the state highways under snow removal during the winter of 1922-1923 was 698 miles. The total cost of this work was $223,908.76. The average cost per mile was $321, and the average cost per inch per mile was approximately $7.

The snow-removal work done by the state has influenced the various counties, and most of the counties in the state now have a snow-removal organization and follow methods similar to those followed by the State Highway Department, the idea being to get out on the work during the storm and to keep ahead of it.

ACKNOWLEDGMENT.—From a paper presented at the Annual Convention of the American Road Builders' Association, Chicago, 1924.

Protection of Small Water-Supplies Used by Railroads

By O. E. Brownell

Assistant Engineer, Division of Sanitation, Minnesota State Board of Health

MANY of the underground water-supplies used by the railroads in Minnesota for supplying water to cars for drinking and culinary purposes are obtained from wells equipped with pumps of the simple hand-operated type similar to those commonly found on farms and at isolated residences. Considerable difficulty has been encountered in maintaining the bacteriological standards of the United States Treasury Department and the Minnesota State Board of Health, for drinking water from this type of water-supply; whereas the bacteriological condition of water from the larger installations, when they are properly located and constructed, has been satisfactory year after year. The more satisfactory bacteriological results which are generally obtained from the larger supplies are principally due to the fact that the heavier pumping equipment fastened to solid concrete foundations is more resistant to vibration and wear than that of the smaller ones, and, consequently, leaks are not so likely to occur.

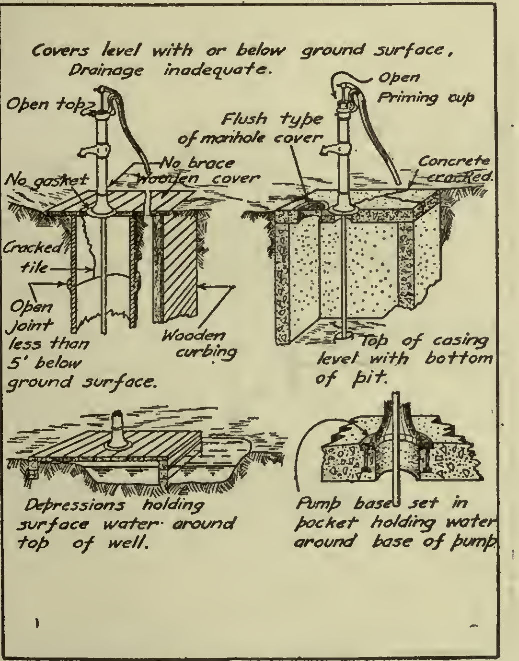

Covers level with or below ground surface, Drainage inadequate.
Open top
Flush type of manhole cover
Open Priming cup
No brace
No gasket
Wooden cover
Concrete cracked.
Cracked tile
Open joint less than 5' below ground surface.
Wooden curbing
Top of casing level with bottom of pit.
Depressions holding surface water around top of well.
Pump base set in pocket holding water around base of pump.

FIGURE 1.—SOME DEFECTS FREQUENTLY FOUND

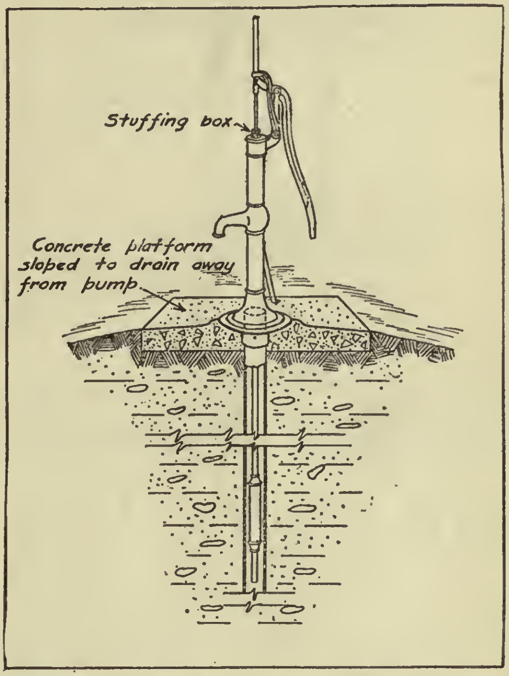


FIGURE 2.—PROPERLY CONSTRUCTED DRILLED WELL

The larger supplies usually have daily care and maintenance, whereas in the smaller supplies defects are often neglected until after contamination has entered the system.

It is probably true that the entrance of a small quantity of certain non-pathogenic bacteria into a supply may not necessarily be detrimental to the health of those drinking the water; on the other hand, the presence of these organisms in the water is an indication that there is an opening in the system through which disease-producing bacteria may enter, and this condition must be considered unsatisfactory and dangerous. Furthermore, the opening through which contamination enters is more likely to become larger through continued action of the agent producing it. Any opening in a water-supply which permits contact of foreign material with the water by a direct or an indirect route affords a possibility for contaminating the supply. Examples of openings through which small amounts of contaminated water may enter

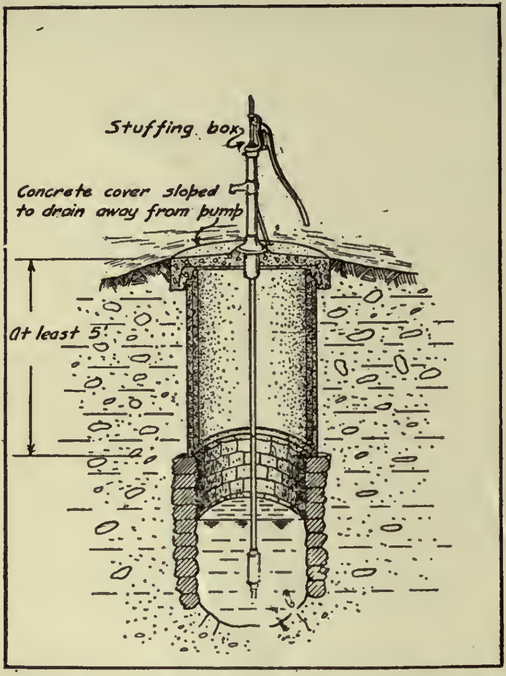


FIGURE 3.—PROPERLY RECONSTRUCTED DUG WELL

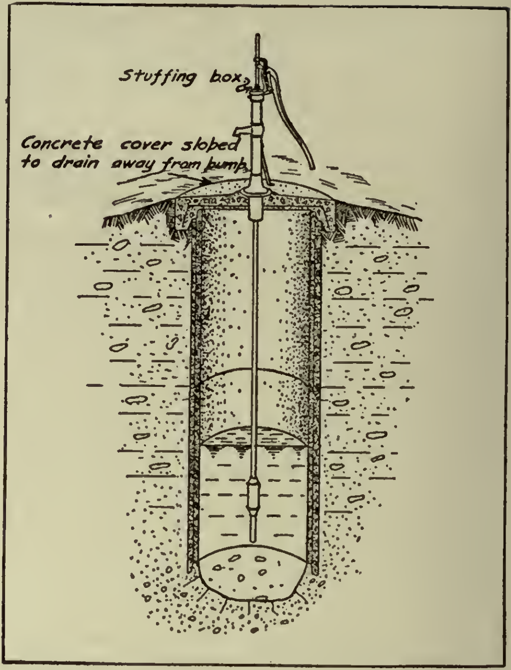


FIGURE 4.—PROPERLY CONSTRUCTED DUG WELL

the supply are worn-out gaskets at the base of the pump, and openings around the pump rod at the top of the pump. The use of wood for the casings and covers of dug wells, which permits surface and waste water to enter the supply through cracks and knot-holes, is another means by which water-supplies are sometimes contaminated. Priming is a dangerous form of direct contact, as the priming water may be polluted and so con-

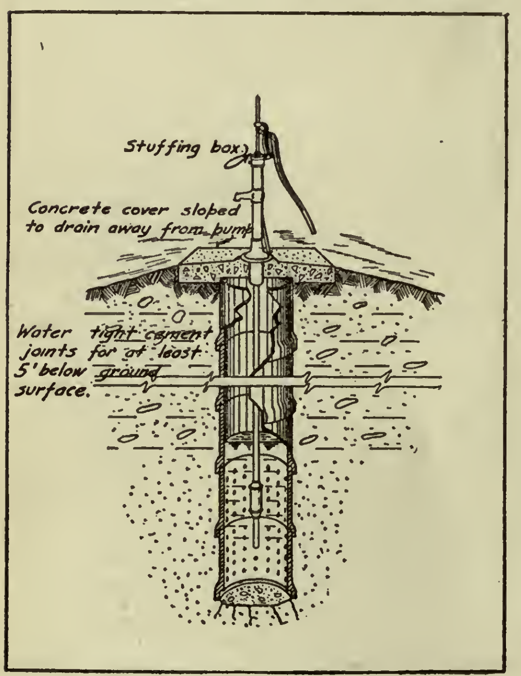

Stuffing box
Concrete cover sloped to drain away from pump
Water tight cement joints for at least 5' below ground surface.

FIGURE 5.—PROPERLY CONSTRUCTED BORED WELL

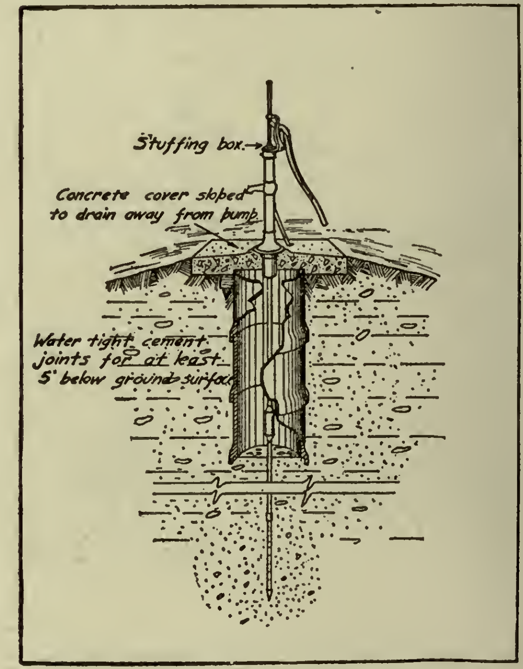

Stuffing box
Concrete cover sloped to drain away from pump
Water tight cement joints for at least 5' below ground surface

FIGURE 6.—PROPERLY CONSTRUCTED DRIVEN WELL

taminate the supply.

Figure 1 illustrates the defects mentioned above, and several others which offer opportunities for the contamination of water-supplies.

The safety of small water-supplies depends upon their proper location, construction, and maintenance. The following general principles govern the location and construction of such supplies: (1) A well should be located as far away as possible from gross pollution, such as privies, cesspools, sewers, etc. (50 feet is considered a safe distance under most conditions found in Minnesota); it should be high enough to exclude the possibility of its being flooded with surface water, and the drainage, either natural or artificial, should be away from the well in all directions. (2) The construction should be water-tight for a depth of at least 5 feet below the surface, and for a greater depth if possible, depending upon the character of the earth, and should extend above the surface for at least 1 foot. Projection above the surface, overlapping covers for manhole openings, stuffing boxes, etc., are forms of construction which should be provided in order to protect these supplies.

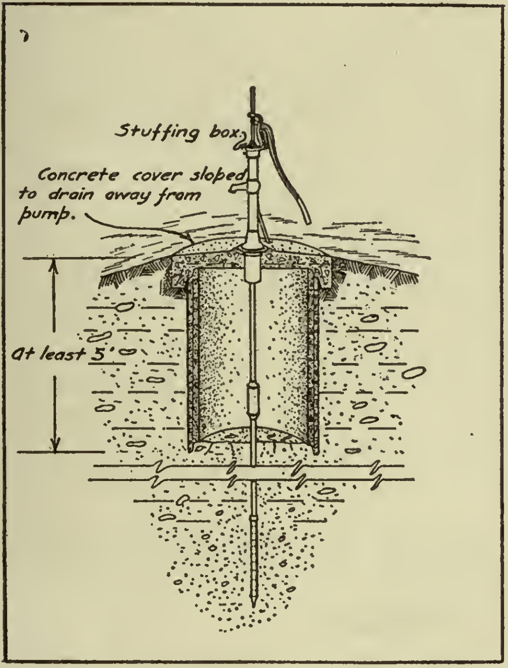


FIGURE 7.—PROPERLY CONSTRUCTED DRIVEN WELL

Figures 2 to 7, inclusive, show various types of wells properly constructed so as to protect the water against pollution. It should be noted that the driven wells shown by Figures 6 and 7 have surface construction which follows the same general principles indicated for properly constructed dug wells (see Figures 3 and 4). It is considered a better principle in the case of new driven wells to construct them with a casing large enough to receive the pump cylinder and with surface construction similar to that shown for the drilled well (Figure 2). Figure 8 shows a detail of pump base construction which may be used with either dug or drilled wells and which will prevent the entrance of contamination at the base of the pump. It should be noted that the casing or pipe sleeve projects up into the pump base so that even though leaks should occur between the pump stand and the pump ase, due to a defective gasket, it would be practically impossible for this contamination to enter the well. Figure 9 illustrates the principle of the overlapping type of manhole cover which should be used for all such openings in wells, tanks, and reservoirs on a water-supply system.

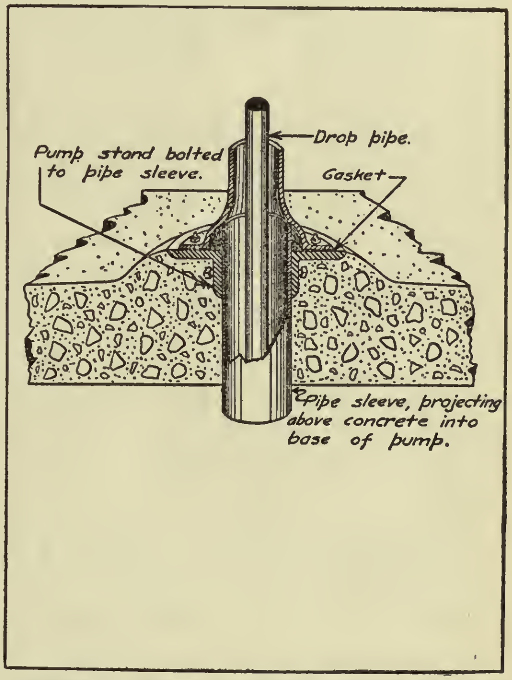

Drop pipe.
Pump stand bolted to pipe sleeve.
Gasket
Pipe sleeve, projecting above concrete into base of pump.

FIGURE 8.—DETAIL OF CONSTRUCTION AT BASE OF PUMP

After the supply has been properly located and constructed, the safety of the water depends upon the proper maintenance and operation of the supply. The persons responsible for these supplies should understand the purpose of careful maintenance which is neces-

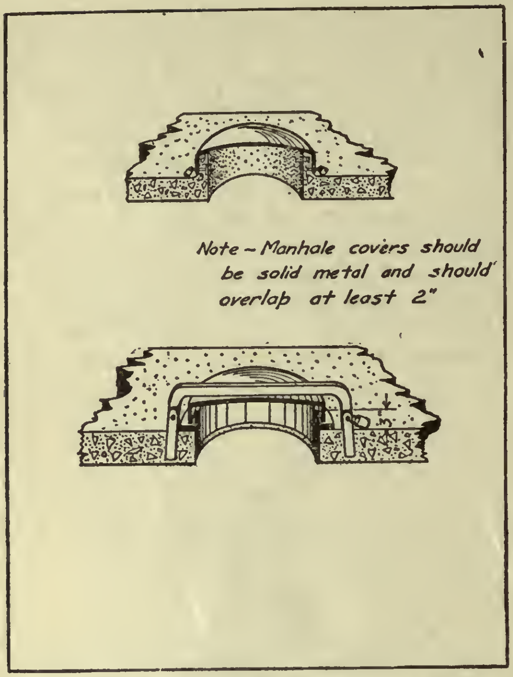

Note – Manhole covers should be solid metal and should overlap at least 2"

FIGURE 9.—MANHOLE COVERS OF THE OVERLAPPING TYPE

sary for their protection. Periodic inspections should be made with a view to detecting defects and making corrections before the safety of the supply becomes menaced.

Contamination is often found in the water from wells which have recently been constructed, even where the construction work has been properly carried out, unless care has been taken to disinfect the well and pumping equipment thoroughly after completing the work. Pollution may gain access to a supply when the system is opened for repair work, at which time parts of its equipment may become infected through handling or contact with foreign material. Water-supplies should always be disinfected following new construction, or repair work, in order to remove traces of contamination which may be dangerous or may affect the results of subsequent examinations of the water. Disinfection of small water-supplies can usually be readily accomplished by introducing into the well one pound of calcium hypochlorite (chlorinated lime). Wherever possible, the chemical should be scattered over the surface of the water in the well so that the powder will sink to the bottom, thereby permeating the supply. If necessary, the chemical may be mixed with 5 gallons of water and poured through some opening where it will drain into the well. The water containing the chemical should be permitted to remain in the well for a period of at least 12 hours, following which the water should be pumped to waste until the odor and taste of the chemical have practically disappeared.

ACKNOWLEDGMENT.—From Public Health Reports, U. S. Public Health Service, Vol. 39, No. 36, 1924.

Collection and Disposal of Municipal Waste in Boston

By Edward F. Murphy

Division Engineer, Sewer and Sanitary Division, Boston

THE question of the disposal of man's rejected materials started at the time when he settled down in community life and all offensive and unclean matter became a menace to health. The development of sanitary science in the problems of water-supply and sewage disposal received the attention of the engineers, and the masterly way in which this was solved brought the matter of refuse removal into prominence.

England was really the first country to realize the importance of some scientific study as to the problem of waste disposal, and was followed closely by Germany and France. America, as her population increased and her cities became congested, was obliged to follow the example of the older countries. In 1887 the first real agitation was started in America, and reports were made by various engineering committees and health associations.

As this problem of collecting and disposing of waste matter has its technical side, the engineering advice of the world was soon called upon to take charge and suggest remedies. Many reports have been made, and in every case it was recommended that the whole subject be placed on a scientific foundation.

Municipal refuse materials are, as one author defined them, "the solid waste materials resulting from the natural activities of a community." This would include the following classes:

Street refuse, such as street sweepings, snow, leaves, etc.

Trade refuse, solid waste from factories, stores, etc.
House refuse, ashes, rubbish from houses, apartments, etc.
Garbage, chiefly food waste

The collection and disposal of the above-named refuse is of vital importance to the comfort and health of every citizen and can be solved only by the true measure of efficiency wherein municipal cleanliness and civic pride will amply repay the citizens for any reasonable expenditure of the public's money.

In Boston, as in all other large cities of America, the present system for the collection and disposal of municipal waste is the result of several investigations to meet the needs of the moment only, without establishing a definite plan or policy. A regular collection and rapid disposal of refuse is one of the most important duties of any municipality. This requires sufficient appropriations, efficient organization, and the cooperation of the public. All these requisites are dependent on each other to obtain any degree of success.

Efficient service in the collection of municipal waste can be obtained by two methods, as follows:

1. By contract, wherein the exact work is specified and requirements are such as oblige the contractor to furnish the desired service.
2. By municipal forces, where the city conducts the work with its own teams, trucks, etc., and the men employed on the work are paid directly by the city.

The majority of cities have adopted the latter method and the results have in most cases been more satisfactory. Municipal operation eliminates the tendency on the part of the contractor to obtain the largest remuneration possible at the least cost.

To maintain successfully and efficiently the collection of municipal waste, not only should strict regulations as to the household treatment be enforced, but considerable time should be spent in a campaign of educating the people in cooperating for mutual advantage.

To obtain the support of the people, the work must be systematized so that regular collections are made at stated intervals. When the householders become accustomed to systematic refuse collection service, we can expect a compliance with our ordinances or laws.

A separate collection of garbage, ashes and rubbish is the method practiced in most large cities in America, and Boston, following the example of other cities, has for the past twelve years tried with very poor success to enforce regulations as to a proper separation. There are certain districts in Boston where there is a tendency to throw garbage into the ash receptacle and ashes, rubbish, etc., into the garbage pail.

The collection of the refuse of Boston is now performed by city day labor forces and by five independent collectors operating under one-year contracts. This work is done under the supervision of the Sewer and Sanitary Division of the Public Works Department. There is also a large quantity of refuse which is collected by private collectors, over which the city exercises no control.

The refuse of the entire city amounts to 482,000 tons, of which 79,000 tons is garbage, 371,000 tons is ashes and 32,000 tons is rubbish, and approximately $1,750,000 is spent by the city of Boston for the collection and disposal of the refuse.

About one-fourth of the total amount of garbage collected in Boston is fed to hogs, and the remaining three-quarters is sent to Spectacle Island, where it is subjected to the reduction process. The ashes and rubbish are used for filling purposes in surrounding low lands.

These methods of disposal have been quite objectionable. The inland dumps have been a nuisance to the surrounding neighborhood and a menace to public health. Rat, fly and mosquito breeding abound at these points, and fires are always a possibility.

For any city there is one best method of refuse collection and disposal adapted to the particular condition existing in that city. For Boston the present system is far from ideal, and the question of finding dumps for the disposal of inorganic or partially mixed wastes is becoming a serious question.

Garbage, of course, is a most difficult material to dispose of without nuisance, and the present method of delivering it to farmers for hog feeding in the suburban districts and reducing the greater part of it at Spectacle Island has been the cause of many justified complaints.

No cure-all can be proposed, but a practical working program susceptible of variation must be put into effect as soon as possible in Boston. I am firmly of the opinion that the time has arrived, because of the scarcity of dumps and the excessive length of hauls, when Boston must look to other means in the disposal of wastes.

Incineration is the only method of disposal lending itself to the solution, and I can consistently recommend a program to that end. This would mean, of course, that in addition to ash and rubbish incineration the garbage and all other waste city material be disposed of by local incineration. From the very latest reports as to local incineration, and with proper sanitary equipment for collection, I can find no valid objection. This would mean that all household waste, ashes, garbage and rubbish would be collected at one time and with swift-moving motor equipment taken to the point of incineration, without any objection on the part of the public. This would allow of better collection service and inoffensive disposal of all refuse, and a substantial saving over present costs for unsatisfactory service.

To provide for the entire city of Boston, eight destructor stations would be required and would cost approximately $2,500,000. This, with an additional outlay for motor equipment of possibly another $500,000, may seem excessive, but an actual saving can be shown over the present expenditure.

Acknowledgment.—From a paper read before the American Society for Municipal Improvements, at Boston.

The Record of a Publicly Operated Isolated Power-Plant

By Egbert Douglas

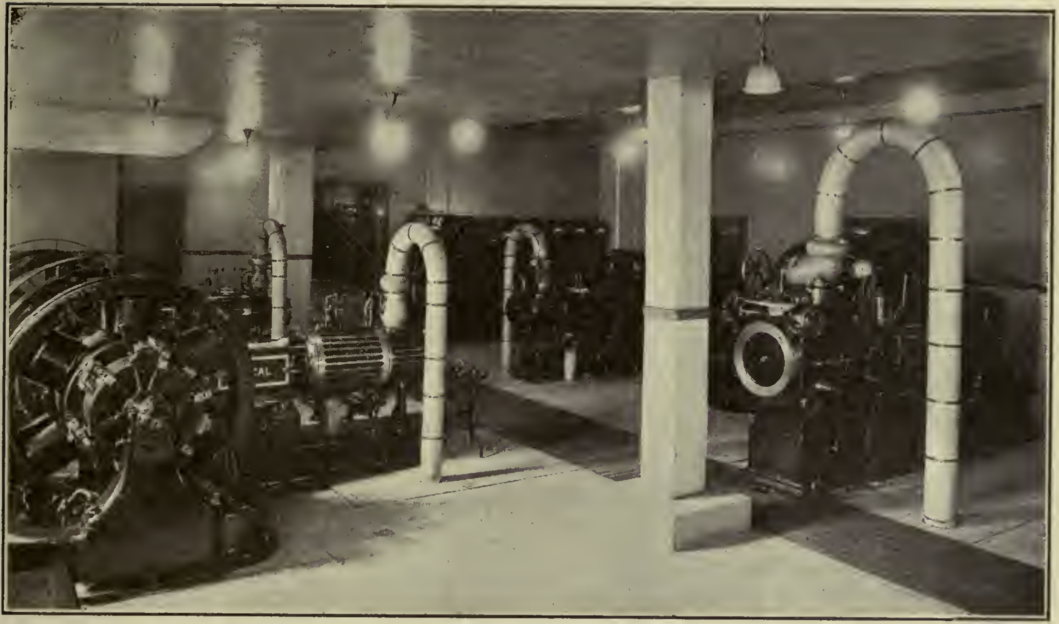
Cahill & Douglas, Consulting Engineers, Milwaukee, Wis.

THE Public Museum of the city of Milwaukee has its own heating and power-plant. The plant has been in the building for more than twenty years, and the principal personnel of the operating organization has remained substantially intact since the plant was installed. The plant is a model from the view-point of efficient operation, and it has given nearly a quarter of a century of continuous service, producing some highly commendable records. The Museum Building is a magnificent piece of architecture and is one of the most highly prized public buildings in Milwaukee. At the present time the building contains the Public Museum and also the Main Public Library of the city. Ultimately the Public Museum will occupy the entire building and the Library will have a structure of its own.

An Isolated Power-Plant

There has been in the past a rather aggressive campaign against publicly owned utilities of all kinds and against the isolated power-plant in particular. The principal argument in condemning the isolated power-plant has been that unless an electric generating plant was large, it had no reasonable excuse for existing. It has also been generally stated that publicly operated power-plants are frightfully extravagant enterprises, which are useful mainly for political purposes and for which the taxpayers pay a long price. Where such conditions do exist, of course, good operating

THE MILWAUKEE PUBLIC MUSEUM AND PUBLIC LIBRARY



POWER-PLANT OF THE MILWAUKEE PUBLIC MUSEUM

results will not prevail, because good power-plant operation is not a political matter but an engineering specialty. In well-designed and properly operated power-plants, politics has no place, and if our public power-plants are kept free from political domination, the publicly owned plant can produce just as good results as the privately owned plant can. The Milwaukee Public Museum has one example of a publicly owned isolated power-plant which is operating successfully and economically.

The power-plant is located in the basement about the center of the building and has been in continuous service since it was installed. No outside power or lighting service is used, and in twenty years the building has never been without light or power, except for one five-minute period. The original plant consisted of four 75-kilowatt, direct-current generators direct-connected to tandem-compound, single-valve, high-speed engines. Subsequently, a 150-kw. generator was installed, which is direct-connected to a four-valve non-releasing Corliss type engine. A 300-kw. generating unit with a controlled-compression Uniflow engine is now being installed. To make room for this latest addition, one of the original 75-kw. units was removed.

The boilers in the power-plant are of the horizontal return tubular type equipped with Hawley down-draft furnaces. There are four boilers, each 66 inches in diameter by 16 feet long.

In the Public Museum one would not know there was a piece of moving machinery in the place, as the plant makes no noise and does not vibrate. The reading-rooms in the Library and the exhibit halls in the Museum are as quiet as a morgue.

Commercial Valuation of the Services

In Milwaukee, the Public Utility Company sells steam heat, electric light and power, and in this municipally owned and operated isolated power-plant direct comparisons are made every month with the public utility rates to see that the plant's steam and electric services are operating as economically as possible, and also whether the plant is making money or losing it, according to the prevailing schedules of the public utility.

The steam used in the building heating system is measured with condensation meters, the same that the public utility uses in the sale of its steam heating service. The electric power and light is also measured with watt-hour meters, and a monthly operating statement is made up showing what the operating balance is in dollars and cents. The quantities of steam and quantities of electricity are shown, and these services are set out in the monthly and yearly operating reports to show just what the plant has made, or lost, as compared with purchased heat and power.

During the four non-heating months, the plant operates at a small loss, because there is no use for the exhaust steam, but during the eight months of the year when heat is required in the building, the operating profit is so large that the deficit of the four non-heating months is wiped out and a net annual profit of more than $13,000 remains to the credit of the plant.

How the Plant Is Managed

The Museum is under a Board of Trustees composed of seven men and two women. Four citizen members and three aldermen are appointed by the Mayor. There are two ex-officio members—the Superintendent of Public Schools and a member of the School Board. These members serve without compensation and consequently are of the caliber that keeps them free from petty politics. The Board meets frequently, and its meetings are public and conducted in a straightforward, business-like manner.

The Museum power-plant sells heat and electric light and power to the Public Library, its tenant, and these services are billed and collected for at the same rates for which they could be purchased from the Public Utility Company serving the city at large. The complete property is in general charge of Dr. S. A. Barrett, General Director of the Museum. The Library is operated by its own organization and merely occupies a portion of the Museum Building as a tenant.

The Operating Force of the Power-Plant

The power-plant operating force consists of ten men: one chief engineer, two operating engineers, four firemen, two coal-passers, and one oiler and cleaner. The operating force looks after all building maintenance and repairs. Doors, windows, bookcases, plumbing and water piping, the steam heating system and electric light and power wiring are all handled by the power-plant operating crew.

For the year 1923, it cost $32,983.03 for fuel, labor and miscellaneous supplies to operate the plant. After charging $4,200 to the general building maintenance work, there remains $28,783.03 for plant operation. For this money the plant produced 613,082 kilowatt-hours, which, if purchased, would have cost the building $21,955.52. There was also put into the heating system of the building during the year 19,364,705 pounds of steam, which would have cost $20,293.74 if it had been purchased. The value of the steam heat, plus the value of the electricity produced at the plant, amounts to $42,249.26. The plant cost $28,783.03 to operate, leaving a net operating profit of $13,466.23 for the year. This is 15 per cent of $90,000, and from a plant that has given over twenty years of continuous service. In localities where long heating seasons are encountered, plants of this nature can produce a handsome profit over purchased service.

Traffic Planning for the Motor Age

THE ultimate purpose of traffic planning is the development of a system of streets so arranged and of such type, width, design, etc., as to meet all requirements of the several kinds of traffic; and to provide for its convenient, safe and expeditious movement throughout the city, whether it may originate from a local source or may be overland travel passing through. Some of the ways in which such results may be accomplished are:

Widening and straightening of streets, where possible.

Cutting through of new streets, where the need is such as to justify the cost.

Removal of obstructions to view at intersections, through use of the powers of zoning.

By-passing of through traffic around congested areas, by the building of appropriate highways through the outskirts of the city.

Perhaps an inner loop around the central business district.

Construction of rapid-transit facilities, either overhead or underground, not only for the railways, but perhaps for vehicular travel.

Elimination of grade crossings.

Segregation of different kinds of traffic, not only by regulation but by the design of appropriate facilities for each.

Provisions for the separation of traffic at intersections.

Removal of pedestrian traffic from street crossings, by the building of subways or overhead walks.

Removal of parked machines from the streets, by providing other facilities so as to reserve the available width for moving traffic.

Improvement of intersections by the rounding of corners.

Installation of permanent and elevated safety zones and loading-platforms for street cars.

Placing central obstructions at important street intersections to direct traffic.

Provision of playgrounds in greater number and suitably located so that children will not cross thoroughfares.

Correction of existing offset intersections by cutting off corners.

Creation of permanent safety isles raised above the pavement surface at the center of wide streets.

Some of these border no doubt on the subject of regulation, but they all have their place in the development of the street system and will determine in many instances the designs to be adopted.

—From a paper by Morris Knowles, Chairman, City Planning Commission, Pittsburgh, Pa., read before the National Safety Congress, Louisville, Ky., October 1, 1924.

Increased Traffic Demands Widening of Single-Track Road

By E. A. Merkel

Formerly County Surveyor, Richland County, Ohio

FOR several years Richland County, Ohio, has followed the practice of building single-track concrete pavements on its less important roads. A 10-foot concrete strip with gravel or macadam alongside is preferred to a wider road of a less durable material, because experience has shown that in a few years traffic is likely to increase to a volume demanding a full-width hard road. By placing a second strip alongside the first, the county gains the two-way road without loss of its original investment and, meanwhile, benefits by keeping maintenance costs at a minimum. The plan has proved to be one of building for the future with a heavy-duty concrete surface from the start.

SUBGRADE PREPARED FOR SECOND STRIP OF CONCRETE. AGGREGATES WERE PILED ON THE OLD CONCRETE STRIP

One instance of widening because of increased traffic was the Mansfield-Shelby Road on which a single-track concrete pavement had been built in 1914 and 1915. The necessity of a two-way hard road was evident from the worn-out strip alongside the concrete caused by cars having to turn off the pavement frequently or by direct travel on the light surface.

The contract for widening this section was awarded in the fall of 1923 to A. J. Baltes of Norwalk, Ohio. The section was 3 miles long and contained 16,000 square yards of new concrete pavement placed directly alongside the original 10-foot strip. The concrete was of the same thickness, namely, 9 inches uniform from edge to edge. Curves greater than 4 degrees were superelevated; greater than 5 degrees widened.

THE MIXER MOVED ON THE OLD PAVEMENT. THE MIX WAS DUMPED DIRECTLY ONTO THE SUBGRADE

Traffic was detoured and aggregates were stockpiled on the pavement. A mechanical loader handled stone to a batch truck which shuttled back and forth between the loader and the mixer. Sand was carted in wheelbarrows. Cement was dumped directly from the bags into the mixer skip. The new pavement was struck off flush with the old and belted.

Single track roads, as Richland County has been building them, are of 9-inch concrete, 10 feet wide, placing them along one side of the grade so that the widening can be effected by the placing of a single strip alongside. The

THE NEW STRIP, PLACED ALONGSIDE THE OLD, PROVIDES A STANDARD-WIDTH HIGHWAY

ON THE LESS TRAVELED ROADS, 10-FOOT STRIPS OF CONCRETE, WHICH CAN BE WIDENED LATER, ARE PLACED

WHEN TRAFFIC DEMANDS IT, RICHLAND COUNTY BUILDS FULL-WIDTH CONCRETE HIGHWAYS

strip is sloped 2 inches from the inner edge. The second strip is sloped correspondingly to give the full-width road a center crown to insure good surface drainage. All concrete must be dense and strong, and tests are made continually of 3¾-inch cores drilled from the completed pavements. For the last two years, concrete pavements have been cured by the application of 2½ to 3 pounds of calcium chloride per square yard of surface.

Of 54½ miles of pavement completed by the county in 1922 and 1923, 45½ miles, or 83 per cent of the total, was concrete construction. It is planned to employ a somewhat different type of construction in the 1924 program. The new design will follow that approved for Illinois road construction. The cross-section will have 10-inch edges and an 8-inch thickness at the center. The writer was in direct charge of county road work from 1915 to 1917 and from 1921 to 1923.

ACKNOWLEDGMENT.—Illustrations by courtesy of the *Concrete Highway Magazine.*

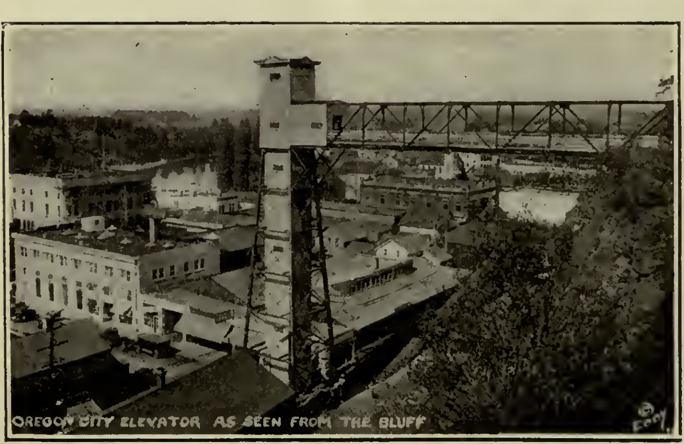
Electric Power for Oregon City's Municipal Passenger Elevator

ECONOMY and faith in the town's growth have influenced the city administration of Oregon City, Ore., to change the mode of power of the free municipal passenger elevator.

The elevator, shown in the accompanying illustration, was erected in 1914, and has been operated by hydraulic pressure until recently, when a 20-horse-power electric motor was installed. The town's water-supply is piped 27 miles from mountains in the Cascade Range, and one-fifth of the supply, or from 350,000 to 400,000 gallons daily, was required to run the elevator. By installing the electric motor this water will be saved to supply the needs of 3,000 additional persons and to provide an ample reserve for fire protection.

The municipal elevator is an institution in Oregon City. Most of the residence portion is on a cliff or "bench" 90 feet above the business and industrial district, which is on the bank of the Willamette River. Running 16 hours each day—from 6:30 o'clock in the morning until 10:30 at night—the elevator carries an average of 4,500 persons daily. Toilers are let down to work in the morning and lifted to their homes again at night.

The original cost of the elevator was $12,000, and the cost of changing to electrical power was $4,000. Two operators are employed, working 8-hour shifts. Salaries, repairs, depreciation, interest, etc., total a little more than $3,000 per year, and this is spread on the tax roll. In the ten years of operation there has not been a single accident.



OREGON CITY ELEVATOR AS SEEN FROM THE BLUFF

A Five-Year School-Building Program

A Scientific Analysis of Elementary Schools Which Included an Engineer's Check on the Educator's Schedule of Needs

By John Elliott Wood

Captain, Corps of Engineers, U. S. Army; formerly Assistant to the Engineer Commissioner, District of Columbia

TWO factors have combined to produce an unsatisfactory educational condition in the public schools of Washington. The war required a curtailment of appropriations which were already insufficient to maintain adequate building accommodations. The close of the war brought a stimulus of enrollment out of proportion to normal increase. These factors exerted a maximum influence in the District of Columbia by reason of its national control. Heavy governmental expenditures were needed to prosecute the war; and the influx of population due to the war produced a sudden and permanent gain in population.

At the beginning of the school year of 1923-24 there was an elementary school enrollment of approximately 53,000 pupils. Forty pupils to the room require 1,318 classrooms. Of this number, there were 966 rooms at least moderately satisfactory, and 103 rooms in either insanitary quarters or wooden portable buildings. This left a shortage of 249 classrooms, which had to be made up by part-time classes. The unsatisfactory rooms are poorly heated, inadequately lighted, and lacking in toilet and service facilities; or are in buildings which are dingy, insanitary or undesirable for other reasons. The part-time classes necessitate attendance at irregular and abnormal hours. Such conditions have a depressing tendency upon children at the most impressionable age of life.

A modern elementary school building of the simplest nature requires toilet and service facilities, corridors, stairways, teacher's offices, auditorium, play rooms for inclement weather and shop rooms and domestic science rooms for boys and girls. But these necessary facilities add to the classroom cost. The most desirable and economical elementary school plant should furnish from 16 to 24 classrooms. Experience indicates that an allowance of $15,000 per classroom should be made in the preparation of a building program. The shortage of 352 classrooms would therefore require an expenditure of approximately $5,280,000. Obviously, Congress could not make such an appropriation in one year when the country is

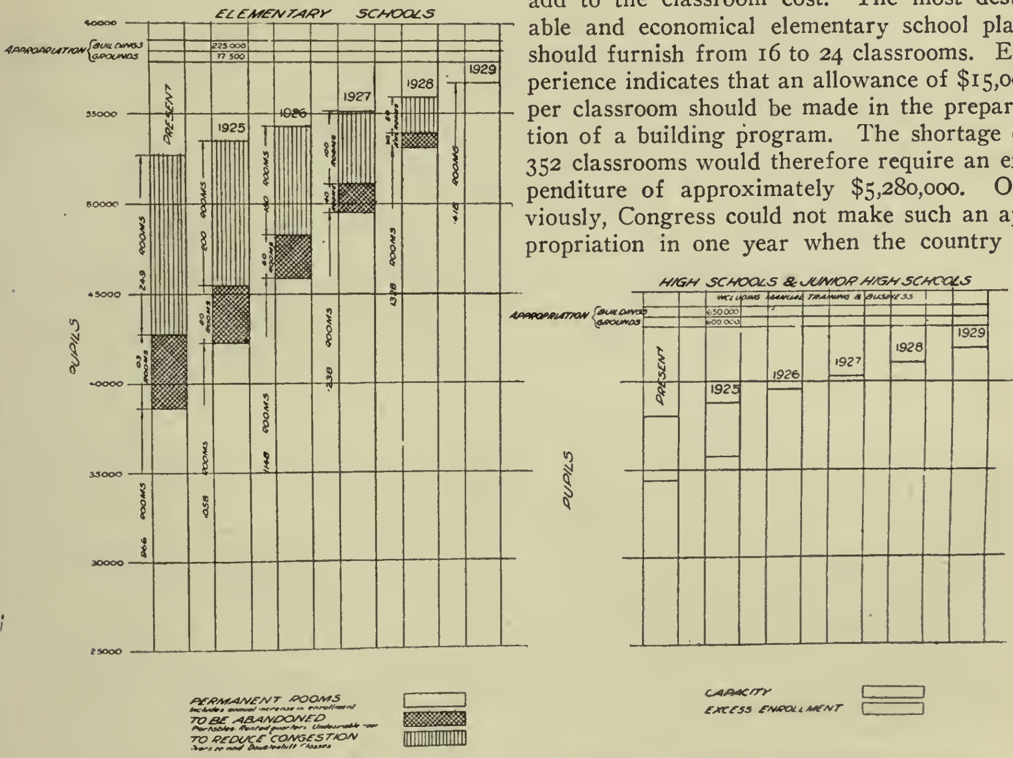


CHART "A" (Analysis of high school needs is not included except as affecting elementary schools) demanding a reduction in taxes. Such a corrective measure must be distributed over a period of years. During this period, however, an increased allowance must be made for normal growth in enrollment.

Preparation of a Budget

The District of Columbia is seeking the restoration of its elementary educational facilities within a five-year period commencing with the fiscal year 1925. Carefully compiled figures indicate that the enrollment in 1929 will reach approximately 57,000 elementary pupils. This will require at the end of the period a total of 1,418 classrooms. Provision of 452 classrooms for 40 pupils each will cost $6,780,000. This estimated cost may be reduced by $950,000, representing construction in progress. The balance, $5,830,000, should be appropriated at the rate of $1,166,000 per year. This will provide ten extensible units of eight rooms each.

WHITE

AREA	1923		1928		5 YEAR BUILDING PROGRAM				1943		20 YEAR BUILDING PROGRAM			
	PUPILS	ROOMS	PUPILS	ROOMS	ROOMS		NEW BUILDINGS	ABANDON	PUPILS	ROOMS	ROOMS		NEW BUILDINGS	ABANDON
					+	–					+	–		
1	2048	68	2069	51		17		2	1967	51		17		2
2	290	14	318	14					333	14				
3	790	38	918	32		6		1	1222	32		6		1
4	220	12	266	12					344	12				
5	370	16	480	16					981	24	8		1	
6	1770	54	2670	67	13		1		4170	102	48		2	
7	170	4	256	6	2				562	14	10		1	
8	2980	61	4663	116	55		3		9367	234	173		8	
9	720	24	1446	36	12		1		4156	104	80		4	
10	350	5	579	14	9		1		2693	87	62		3	
11	1710	60	1672	56		4			2116	56		4		1
12	950	16	1943	48	32		2		5244	131	115		6	
13	4670	52	6506	162	110		5		9168	229	177		8	
14	4790	48	8230	130	82		4	1	3830	146	98		4	
15	3160	54	3878	84	30		2		3758	94	40		2	
16	3300	60	2926	73	13		1		2734	68	8		1	
17	3260	49	3160	79	30		1		3850	84	38		1	
18	2910	28	2833	71	43		2		2694	67	39		2	
19	5140	116	5468	136	20				6040	151	35			
20	3720	96	4514	108	12				4483	112	16			
21	330	8	340	8					350	8				

SCHEDULE SHOWING DISTRIBUTION OF ELEMENTARY SCHOOLS AND PUPILS IN THE DISTRICT OF COLUMBIA

OFFICE OF THE ENGINEER COMMISSIONER, D.C. *JULY 1st 1923.*

COLORED

AREA	1923		1928		5 YEAR BUILDING PROGRAM				1943		20 YEAR BUILDING PROGRAM			
	PUPILS	ROOMS	PUPILS	ROOMS	ROOMS		NEW BUILDINGS	ABANDON	PUPILS	ROOMS	ROOMS		NEW BUILDINGS	ABANDON
					+	–					+	–		
1	2118	68	2208	88					2365	68				
2	493	28	566	28					713	28				
3	543	24	741	24					1137	28	4		1	
4	167	6	202	6					272	7	1			
5	42	2	89	3	1				188	5	3		1	
6	55	4	79	4					138	4				
7	91	4	107	4					134	4				
8	16	1	30	1					60	2	1			
9	514	16	567	16					676	16				
10	281	8	362	8					267	8				
11	567	8	738	20	12		1		1082	27	19		1	
12	2357	54	2671	67	13		1		3308	83	29		2	
13	3495	72	3878	98	26		1		4636	116	44		2	
14	316		341	8	8		1		302	8	8		1	
15	1509	32	1672	42	10		1		1988	50	18		1	
16	785	20	933	24	4				1234	31	11		1	
17	1035	28	1165	30	2				1447	36	8		1	

CHART "B"—STUDIES ARE BY RACES. A BUILDING REFERS TO EIGHT-ROOM UNIT. THE TWENTY-YEAR PROGRAM IS OUTSIDE THE SCOPE OF THIS DISCUSSION

Chart "A" indicates the manner in which unsatisfactory rooms and congestion should be reduced. In addition, it shows that high school facilities now representing 13,000 pupils must be increased over the same period for 24,000. The rate of elementary school growth is being diminished by the institution of the 6-3-3 combination of elementary, junior and senior high schools. In the adoption of junior high schools the eight elementary grades will be reduced to six. This in turn will add to the rate of growth on the "high school" item.

The high school needs are not embraced in this study, because of greater limitations in the acquisition of suitable building sites and the more generous freedom in centralization. It is not unreasonable that high school pupils should travel one mile or more. It is more desirable to provide ample accommodations of a thoroughly satisfactory nature in the suburbs than to crowd pupils of the most active mental and physical age into congested quarters and playgrounds. The high school problem is made more simple by its distribution into academic, manual training, business and junior groups.

The Board of Education is required to provide separate schools for white and colored races. In Washington equal educational facilities are provided for both. No distinction is made in this study, inasmuch as it is based on similar school units properly distributed.

Statistical Charts Furnish Basis of Analysis

The study in rate growth is based on figures shown in Chart "B." For purposes more in detail than this discussion can go, the studies are by races. The figures were compiled from arbitrary subdivisions on a map of Washington as shown on Chart "C" and on a similar chart showing the distribution of colored pupils. On the individual areas, which are numbered to agree with the printed schedule, is made a count of expected population during the twenty-year period ending in 1943. An interpolation is made for the five-year period ending in 1928. Failure to secure appropriations requested for 1924 necessitates postponement of the program to terminate in 1929.

Chart "B" shows by areas the present number of pupils and corresponding number of classrooms; also the estimated number of pupils in 1928 with corresponding required classrooms. The difference is the number of rooms to be provided or abandoned. New buildings are indicated in units of eight rooms each, the final plant to embrace either two or three such units. Such an analysis is especially valuable, since it shows the change in the requirements of each respective area due to the outward tendency of residential growth. For example, area "1" is located directly south of the Capitol. It was formerly a considerable residential section. It now has 68 classrooms for white pupils. The white population has become so reduced since these rooms were provided that only 51 will be needed in 1928, leaving 17 to be abandoned.

The greatest area of white growth is shown in area "13" located in the most popular residential section bordering Zoological Park. These sections are known locally as Mt. Pleasant on the east and Cleveland Park on the west. This area now has 52 classrooms. An elementary school population in 1928 of 6,506 will require 162 rooms, an increase of 110 rooms.

Judgment in the Application of Results

In similar manner the entire District of Columbia is studied in order to determine the approximate location of future elementary schools. The results must be considered purely general, because of the arbitrary character of the subdivisions. Obviously, the requirement near the corner of four areas partakes of the composite rather than of the area in which located. The virtue of this generality is in its elasticity of choice in building sites. Suitable sites are difficult or easy to acquire, depending on whether the section is densely or sparsely developed. Interestingly enough, the location of proposed buildings so simply determined indicates directions of growth which are confirmed by fact.

Annual appropriations normally become law during the month of March for the fiscal year beginning July 1 thereafter. This furnishes opportunity for the immediate preparation of plans for buildings in those areas selected by the Board of Education. It is the policy of the Engineer Department to have under contract as near July 1 as possible all buildings provided in the annual budget. The coordination between the Board of Education and the Engineer Department is so complete that maximum results are obtained under this system. The work of the constructor and the work of the educator are distinct from, yet complementary to, each other.

Schools for elementary pupils should serve an area embraced in a half-mile radius. The site should provide not less than four acres in order to afford a plant of two or three eight-room units and playgrounds adjacent. The buildings are to be provided without luxury or embellishment, but of sufficient architectural character to impress the pupils with ideas of

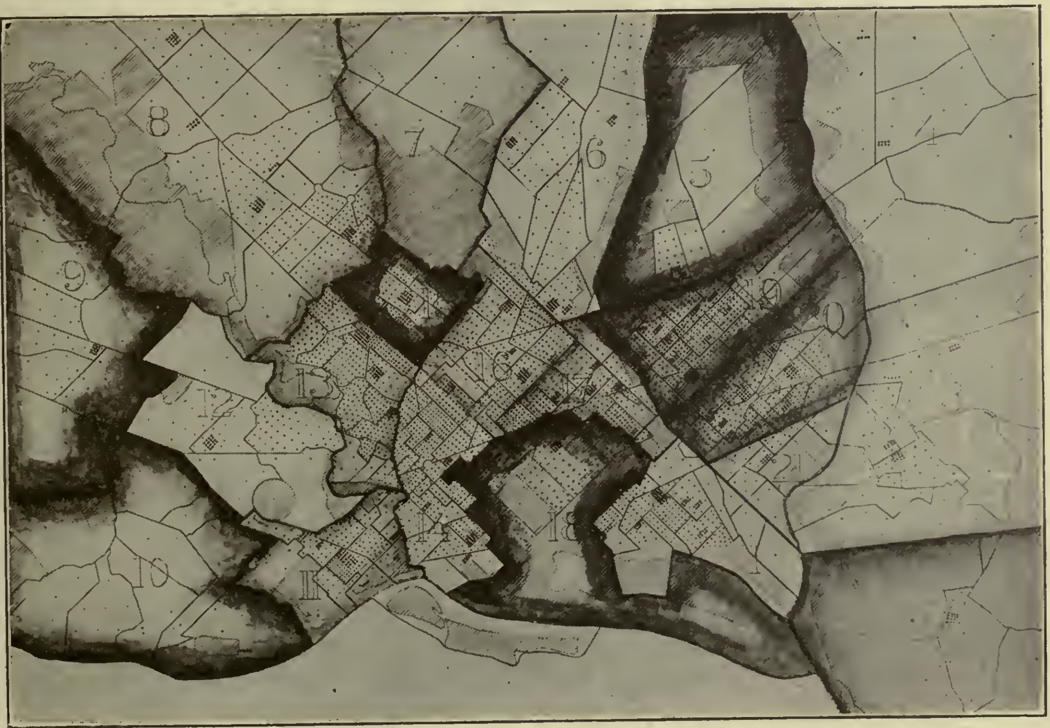


CHART "C"—DISTRIBUTION OF ELEMENTARY PUPILS, WHITE

Areas are those shown in first column of Chart "B." Dots, lines, and hatched areas indicate respectively school population, streets, and public grounds. A similar chart was prepared to show the distribution of colored pupils simplicity, taste and cleanliness. All units are so planned as to permit extension up to a minimum of three such.

Coordination in Administration

School buildings in Washington are designed by the Municipal Architect under the direction of the Engineer Commissioner. The latter official is charged with the provision and maintenance of suitable public school accommodations. This study has been made in collaboration with the Board of Education which furnished its educational requirements. The population figures are based upon a careful study of growth statistics prepared by the local telephone company. A proper factor was used to reduce population to terms of pupils. The location of schools, the purchase of the necessary property, and the plans of buildings are subject to the joint approval of the Board of Education and the Board of Commissioners of the District.

The unique manner of analysis herein described was chosen by the Engineer Commissioner as the engineer's check on the educator's schedule of needs. The study is simple and convincing. It is being presented to the appropriation committees of the Congress as indicative of a condition which must be remedied. The measures sought are necessary. The period of correction is reasonable. The results, based on assumed growth, are irrefutable.

Enlivening a Health Report by Effective Illustrations

THE recently published annual report of the Department of Health of Winston-Salem, N. C., is an excellent example of a document whose popular interest is much enhanced by the charts and pictures which it contains. There are no less than 37 such illustrations in the 96 pages of the report. The charts were prepared locally; but for other illustrations credit is given in the report to the Metropolitan Life Insurance Company, the American Child Health Association, the Minnesota Public Health Association, and the American Medical Association.

As an example of the use of these illustrations, the following paragraphs and cuts are reproduced from the section headed "Modern Health Crusade."

"The Modern Health Crusade method of teaching health habits to children of impressionable age in this city's schools has been used for the past three years. The plan is very simple and is made attractive to little folks, who learn health habits by doing them instead of memorizing something they do not understand from a text-book. Only children of third, fourth and fifth grades are enrolled as Crusaders—for the obvious reasons that first and second grades do not quite understand the chores and those above fifth grade have more nearly formed habits for good health or bad health. Best results are obtained with the younger grades mentioned.

"The elements of play, team work, romance and competition are introduced in such a way as to appeal strongly to little folks, and under the leadership of an interested Crusade worker more than 4,000 children were enrolled in 75 classes, 20 of which were colored.

"One nurse is made responsible for the organization and general direction of the Crusade groups. Of course she works in very close cooperation with other school nurses and teachers, as well as parents at home, whom she visits from time to time to check up the child's home habits and home surroundings.

"It is the opinion of this department that the Modern Health Crusade is of very decided value in teaching health in a very practical way to children at a time when it is most easily received by them. If such teaching health habits is properly associated with physical examinations and correction of defects, together with proper physical exercises, the result will undoubtedly be a splendid influence toward the development of more nearly perfect men and women physically."

EDITORIAL NOTE.—An outline of the assistance which the American Child Health Association, 370 Seventh Avenue, New York City, is prepared to render, along the line of material for use in health campaigns, is contained in the article "For Your Health Campaign" on page 22 of THE AMERICAN CITY for July, 1924. Study outlines for women's clubs, practical plan pamphlets for teachers, child care handbooks for parents—something designed to enlist the interest of every group in the community has been prepared by this Health Association. All this health education material possesses that inspirational quality which has made the silhouette posters, described in the article referred to, so instantly successful. It is suggestive of devices and schemes, of plans and programs. It is designed for you and your health campaign. Literature on how to conduct a Modern Health Crusade may be secured upon application to the National Tuberculosis Association, 370 Seventh Avenue, New York.

Public Regulation of Plumbing in Dwellings

By the Subcommittee on Plumbing of the Building Code Committee of the United States Department of Commerce

Definition of Plumbing

THE "plumbing" of a building, as the term is commonly used, includes the pipes for distributing the water-supply, the fixtures for using water, and drainage pipes for removing waste water and sewage, together with fittings and appurtenances of various kinds, all within or adjacent to the building. The "service pipe," which forms the connection between the water-main and the building, and the "house sewer," which conveys the waste water and sewage from the building to the street sewer or other point of disposal, are included in the "plumbing system" of a building, using the term in a broader sense. Connections for rain-water are also included, if the water is discharged through a house sewer or a house drain. The water-supply and drainage system are mutually dependent. Drains are needed to carry away the used water; water is needed to cleanse the fixtures and transport solid wastes.

The work of the committee has emphasized the necessity of considering the plumbing systems of buildings as intimately related to and forming an integral part of public water-supply and sewerage systems. The number and character of plumbing fixtures in a building are largely matters of individual choice, and owners have not sufficiently considered their relation to features of public service. Plumbing fixtures are the terminals of water-supply systems, and, to a large extent, control the quantity of water used. At the same time they are the beginnings of the sewerage system. The aggregate discharges from plumbing fixtures determine the flow in sewers and the volume of sewage reaching the outfall, this volume materially affecting the cost of any pumping or treatment of the sewage. It is evident, therefore, that the public interest may well justify a certain degree of governmental control over plumbing fixtures as affecting both the quantity of water available for public use and the economical operation of the sewerage system.

EDITORIAL NOTE

This article is chapter 1 of "Recommended Minimum Requirements for Plumbing in Dwellings and Similar Buildings," published May, 1924, by the U. S. Department of Commerce.

This publication was prepared under the direction of a committee of experienced sanitary engineers and expert plumbers, whose names appear in the introduction, and the work has engaged professional attention throughout the country. Large numbers of plumbing inspectors, health officers, sanitary engineers, and architects have collaborated with the committee, and the final draft of the report represents not only the results of extensive experiments at the Bureau of Standards but the consensus of experience as reported by these men.

The report contains, in addition to a recommended plumbing code for adoption by cities and states, an extensive report by the Bureau of Standards giving the procedure and results of experiments with plumbing systems carried on for over two years at that institution.

The report also presents a considerable amount of data and discussion interpreting the results of this experimental work and showing how the Committee arrives at its recommendations for code revision. There are chapters on the lack of uniformity and agreement in present plumbing codes and on the desirability of simplification of plumbing supplies and fixtures. The report discusses the relation of plumbing to health and the considerations involved in the licensing of plumbers, and plumbing inspection as a means of code enforcement. The appendices describe recent developments in the theory of corrosion of metals, and investigations of the diffusion of gases in unventilated pipes.

The report contains 260 pages of text, with 100 illustrations, and is obtainable from the Government Printing Office, Washington, D. C., at 35 cents a copy.

Relation of Plumbing to Health

An important function of the house-drainage system is to carry away from plumbing fixtures human excreta and wastes which may contain disease-producing bacteria. Because of the possible presence of such organisms, sewage may be dangerous and must be disposed of in such a manner that there will be no chance of disease transmision. Sanitarians to-day place great emphasis on the importance of sewage treatment and safe methods of ultimate sewage disposal.

The leakage of polluted water from the house-drainage system is insanitary and dangerous. Leakage within the house may pollute the habitation and permit food infection through the medium of insects. Leakage in the ground outside the house may pollute water-supplies taken from neighboring wells or find its way into or under the building.

The maintenance of water-seals between fixtures and drains and the permanent tightness of plumbing systems are important, not only because they prevent the passage of air, but because they prevent the access of insects to the interior of the drains and sewers. If cockroaches, water-bugs, and other vermin can pass from drains to food, they may transport disease germs, and thus be a bacteriological menace to health. It is, therefore, important that the drainage system be tight and without danger of leakage.

L. O. Howard, chief of the Bureau of Entomology of the United States Department of Agriculture, and C. W. Stiles, United States Public Health Service, in personal conversation with the chairman of the committee, are authority for the statement that insects can and do pass from the interior of leaking drainage systems to living quarters. Several other observers also report such occurrences.

Another danger to be guarded against is the use of fixtures in which the water-supply and waste connections are so arranged that polluted waste water from the fixtures may, under certain circumstances, return into the water-supply pipes.

The line where the safe water-supply ends and sewage begins is sometimes very finely drawn. If faucets with open spouts discharge over plumbing fixtures and if there is a break between the water-supply and the waste pipe, self-protection exists against possible pollution of the water-supply distributing system by the back flow of waste water into it. Plumbing fixtures such as water-closets, urinals, bidets, bathtubs, and lavatories with direct connections, secret wastes and overflows, and combination cocks offer possible sources of pollution.

The air in sewers and drains often contains gases resulting from the decomposition of excreta, soap, fats, and other wastes, together with gases from mineral oils which may come from garages, streets, and industrial establishments. Illuminating gas may also find its way into sewers through leakage. Among these gases may be found methane, sulphuretted hydrogen, and carbonic oxide. In large amounts, those gases are poisonous to the human system, and there are physiological objections to breathing them even in small quantities. Hence, the air of sewers or drains should be kept from entering buildings intended for human habitation or occupancy by the use of proper plumbing installations and by suitable ventilation of the rooms or compartments in which the plumbing fixtures are located. The smell of these gases and other emanations from decomposing organic matter is naturally repugnant to human beings. It not only offends the sensibilities, but may produce shallow breathing, headache, and even nausea.

In addition to the above facts, it is important to consider the bacteriological aspects of sewer and drain air, a subject upon which there has been some misunderstanding. In recent years, bacteriologists have made studies which have thrown light upon this subject. They have shown by experiment that, while sewage often contains disease-producing bacteria derived from human excreta and body wastes, these bacteria are rarely found in the air which escapes from sewers and drains. Hence, it has been argued by some that escaping sewer air has no influence on health. The committee does not agree with this conclusion. Health may be influenced by factors which do not cause specific diseases, for there are chemical and physiological as well as bacteriological factors involved. The investigations thus far made by bacteriologists should be considered to be merely a beginning of larger and more complete investigations which will doubtless be made as the science of bacteriology advances. The committee is of the opinion, therefore, that until further light on this somewhat obscure subject has been obtained. the escape of sewer air from the house-drainage system, at frequent intervals or in considerable quantities, threatens the health of the building's occupants.

This whole matter has a quantitative as well as a qualitative aspect. The temporary losses of water-seal in traps, which rarely occur and which are immediately replaced, do not involve any great danger to the health of the occupants, for in many cases the final drainage from the fixture will renew the seal within a short time, but where a loss of seal is likely to be of frequent occurrence and not readily replaced, or where breaks in the system admit sewer air continually to a building, the health of the occupants is subject to the dangers heretofore described.

Public Control of Plumbing Justifiable

For the above-mentioned reasons, regulations governing the installation of plumbing have been established by law in many places. These regulations have been potent in improving living conditions throughout the country; in fact, they have even set the standards for those places where plumbing is not under public control. The knowledge now in possession of sanitarians in regard to the lessened bacteriological dangers of sewer air leads logically to some simplification in plumbing design, but it should not lead to an abandonment of practices necessary to protect buildings against the air of drains, which, in addition to its possible danger, is offensive to the smell.

The committee believes that good plumbing is a matter which concerns health. Government has the right to protect the people's health, but people also have rights, and plumbing regulations carried too far are unjust. Regulations which will not be supported by the courts fully and without question under a liberal interpretation of the police power may be regarded as unjust. Sanitary science, however, must be the guide to justice in this matter. The principles of science change as knowledge advances, and it is proper, therefore, that plumbing regulations be reviewed from time to time and, if necessary, revised.

Legal Principles

It is impossible to study the subject of plumbing regulation without having a proper conception of the common-law principle known as "police power," for, though a part of the common law and without absolutely definite limits, it can and must control court decisions, without which plumbing regulations would be futile. Attention should be called to the fact that this legal term "police power" does not mean the power of a policeman. It is true that the policeman, with his uniform and his stick, is one agency for enforcing the "police power," but plumbing inspectors, building inspectors, fire marshals, and health officers also act under the same "police power." Police power is that inherent power of government which protects the people against harmful acts of individuals, in so far as matters of safety, health, morals, or the like are concerned. "Police power" is "community power." Injuries against health come within the proper scope of the police power; but acts of government to enhance or promote health above normal, while laudable and often justifiable, do not fall within the scope of the police power.

There is a difference between conferring a benefit and preventing an injury, which, though difficult to define, is nevertheless real. Some of the requirements now generally included in plumbing codes represent a failure to make this distinction properly and cannot be justified as essential to the protection of the public health from injury. When there is difficulty in enforcing such regulations and the cases are brought into court, it often happens that the code requirements are not supported. In this way well-meaning citizens comply with regulations which cannot be enforced upon the unwilling citizen, and injustice results. Unfortunately, this situation exists to-day. Plumbing regulations, therefore, should be carefully examined in the light of modern sanitary science and accepted legal principles to determine their legality, keeping in mind that in so far as they protect the human health against injury they are justifiable, but no farther. It should be observed also that legally the police power has to do with "health," not merely the "public health." This is a distinction which even a health officer often fails to make.

The following principles may be considered as safe guides in the matter of governmental control:

1. The control of plumbing by government is distinctly an act done under the police power, because it has to do with protection of the health of the people against injury, using this term in its broad and popular sense.

2. This use of the police power resides fundamentally in the state governments, but may be and often is delegated to cities, towns, or other subdivisions of states.

3. The police power has not been delegated to the Federal Government, except so far as needed to carry out certain delegated powers (as, for example, quarantine); hence, the Federal Government has only advisory powers regarding its employment by states.

4. The use of the police power in plumbing regulations is justified on the theory, supported by scientific evidence, that the passage of rats, cockroaches, water-bugs, and other vermin in and out of drains, or the escape of sewage or of air from drains or sewers into occupied human dwellings, are menaces to health, using this term in its broad and popular sense.

5. Plumbing regulations cannot legally contain requirements which do not, either directly or indirectly, prevent injury to health, safety, morals, or the like. No requirements can legally be made which have to do merely with economies of construction, with benefits to the house owner or occupants, or with benefits to manufacturers, traders, or laborers, for the right and only legal use of the police power is to protect against injury.

6. The design of plumbing systems is properly within the scope of legal regulation in so far as it has to do with the escape of solids, liquids, or gases from, or the access of vermin and insects to, drains and sewers, in such a way as to endanger health, and in so far as a safe and adequate supply of water

to the fixtures is concerned.

7. Plumbing materials are properly subject to legal regulation in so far as their reliability in preventing dangers to health is concerned, looking ahead to a reasonable life of the building.

8. Methods of plumbing construction are properly subject to legal regulation in so far as they may be necessary to guard against danger to health through faulty workmanship.

9. The control of plumbing by the system of permit and inspection and test is a logical and apparently a satisfactory way of guarding against injury to health through faulty plumbing; but in view of different conditions existing in large and small communities, the states should delegate to local communities the manner of administering this control.

10. The system of examining plumbers is for the public benefit and should be continued, but it might be better for the examining authorities to issue certificates of competency rather than "licenses."

11. The requirement that plumbing work, subject to permit and inspection, be done by licensed plumbers is justifiable under the police power.

12. Uniformity in methods of plumbing control is desirable, as it makes for convenience and economy. Uniformity can be secured by following models set up by Federal or state governments.

13. Standardization of plumbing designs, so far as dimensioning is concerned, standardization of plumbing materials, and even standardization of code requirements, are for the public benefit, rather than for protection against injury, and should be brought about by agreement and concerted action. They cannot be required legally under the police power.

14. As the poli e power resides in state governments and as uniformity in plumbing regulation is for the public benefit, it is well for all states to have simple, uniform, statewide plumbing regulations alike in essential respects, limited to matters which properly come within the scope of the police power under a wide range of conditions, with provision for permitting local communities to regulate installation and inspection by such methods as they see fit to adopt. These may be appropriately called "basic plumbing principles."

15. The residence or dwelling is the basis for plumbing codes, because the majority of all buildings are of this type. A code applicable to dwellings is also applicable, although not necessarily sufficient, for other classes of buildings. Buildings differ as to plumbing conditions, so that different regulations for different classes of buildings are fully justified under the police power. In fact, to apply the same regulations to different conditions; that is, to require practices necessary in one case for another case where they are not necessary, is an improper use of the police power. The fourteenth amendment to the Constitution of the United States provides for "equal protection of the law," but equal protection means under like circumstances.

16. In addition to the basic plumbing principles, it is well for each state to adopt a code of plumbing rules conforming substantially to that hereinafter recommended, which has been so drawn that compliance therewith will practically assure compliance with the basic plumbing principles.

17. It is a well-established principle in drawing specifications for works which involve operation, that guaranteed results and detailed methods of construction should not both be specified at the same time. If certain guaranteed results are demanded, the contractor should be allowed some latitude in construction, and if detailed methods of construction are specified, it should be expected that the desired results will follow as a matter of course. Similarly, if reliance is placed on a general code of basic plumbing principles, there should obviously be freedom of choice as to many details; whereas if cities or towns choose to adopt a more rigid and detailed set of requirements, compliance with them should be regarded as prima facie evidence that the desired results will be obtained.

Continued Gain in Whole-Time County Health Officers

According to data obtained by the Rural Sanitation Office of the U. S. Public Health Service, there was a net gain of 20 counties in the United States having whole-time health officers on January 1, 1924, as compared with the previous year. The total number of counties or districts providing such service for their rural sections increased from 109 in 1920, to 161 in 1921, 202 in 1922, 230 in 1923, and 250 in 1924. Most of the increases during the last year were in states in which the respective state health departments, with the cooperation of the U. S. Public Health Service or the International Health Board, or both, were enabled to give encouragement, technical advice, and financial assistance to county or district health departments.

The Effect of Industrial Wastes Upon Sewage Problems

By Langdon Pearse

Sanitary Engineer, The Sanitary District of Chicago

FROM the sewage standpoint, the effect of industrial wastes may be considered from several angles: first, the question of maintenance of sewers to avoid deposits detrimental to structure, and to secure freedom from local nuisance and from explosive gases or gases dangerous to workmen in the sewers; second, the effect of such wastes upon the operation of sewage treatment works where such are required; third, the effect of such sewage upon the capacity for loading of the sewage treatment works. The extent of the problem generally requires special investigation in each locality, in order to determine the nature of the industry, the amount of its waste or its liability to accidental discharge of troublesome material. The magnitude of the industrial waste problem in any locality will of course depend upon the relation of the production of industry to the human population. In the case of the Sanitary District of Chicago, the industrial wastes from the packing-houses, the Corn Products Refining Company and the tanneries aggregate easily the equivalent of the wastes from 1½ million people, while the total human population approximates 3,200,000. In another case the effluent from a starch works is possibly equivalent to the waste from a population of about 175,000 people, while the human population is about 50,000. These are perhaps abnormal examples, but indicate the extent to which the industrial equivalent population may overbalance the human population.

Effect on Treatment Works

In the operation of sewers the need of preliminary treatment may arise where a rich industrial waste like that from a corn products works comes into a long outfall sewer, where the rich, warm waste mixes with the human sewage and travels for a considerable distance. A very vigorous decomposition may ensue, producing hydrogen sulphide, so that odors come up through the manholes at intervals and occasion complaint. Various remedies have been suggested, including a thorough investigation of preliminary treatment, together with the treatment of the waste before it leaves the starch works, to learn if the decomposition which ensues cannot be kept in aerobic lines instead of anaerobic, thereby oxidizing the bisulphites instead of allowing them to be reduced to sulphides. The need of such investigations may occur with other types of wastes from beet sugar works, tanneries and the like.

More Thorough Study of Wastes Needed

The experience of the writer in connection with the investigation of waste problems in the Sanitary District of Chicago and outlying territory emphasizes the need of a thorough study of such wastes, their character, composition and behavior in the planning of sewage works, and shows the value of extended investigation where such materials have to be handled on any large scale. It further emphasizes the need of foresight by operators of large industries in locating their plants where natural resources available for dilution will aid in postponing the day of complete treatment.

Effect of Corn Products Wastes

In the maintenance of sewage treatment works, the effect of industrial wastes may be very obvious where such wastes contain oil or tar. In the operation of the Des-Plaines River sewage treatment works, at times considerable batches of oil come down. Some of this appears to be from garages on the drainage area and some has been traced back as tar to a factory manufacturing roofing paper. In the latter case, much of the material reaching the sewer appears to have come through carelessness from handling tank cars on a side track, or in emptying tanks. Such oils in part float on the surface of the treatment works and may usually be removed by skimming, if need be. It would seem to be desirable so far as possible to require such material to be retained at the source. The inspection of industries and proper regulation of discharge afford some relief.

In considering the effect of industrial wastes upon treatment, the problem for the designing engineer is largely one as to the effect of the waste upon the loading which biological filters or activated sludge may carry, as well as the effect upon the sludge production in tanks; or other preliminary treatment; the need of preliminary treatment before discharge should be studied in relation to the industry. In the corn products industry, properly operated, there seems to be very little need of any screens or even settling, in that such suspended matter as comes is very finely divided and unless coagulated by lime will not deposit in sufficient amounts to pay for sedimentation. On the other hand, in the handling of tannery wastes, the use of both screen and sedimentation may be well worth while as a preliminary to final treatment, unless the percentage of industrial wastes is very low. The effect of the industry upon the sludge production will depend upon the proportion of waste. Industries such as glue works and tanneries discharge a large amount of spent lime, which produces a large volume of sludge. Paper mills may discharge quantities of comparatively inert sludge of fibrous character. Other industries, like the corn products, discharge most of their organic matter in solution or very fine suspension, thereby having little effect upon preliminary sludge production.

The effect of the industrial wastes upon the biological treatment again depends upon the percentage of waste present and its character. Some wastes may have a sterilizing effect, as was shown by the copper salts present in certain outlets of the New Haven sewer system in the tests made by Dr. F. W. Mohlman for Professor Winslow in 1918. In other cases, the presence of considerable organic matter may stimulate bacterial action and unless carefully watched may cause putrefactive odors. In the treatment of industrial wastes, the value of mixture with human sewage is often apparent to properly seed the mixture, and in particular in the handling of starch wastes, some of which at the point of origin are often sterile. In the effect upon the loading, the total amount of organic nitrogen present seems to have a bearing which apparently affects the activated sludge process more rapidly than the trickling filter. In the tests made at Argo for the Corn Products Refining Company under a cooperative agreement with the Sanitary District, Professor Bartow, Dr. Mohlman and the writer have noted that when the total organic nitrogen of the sewage exceeds some 50 p.p.m. there is considerable difficulty in operating the activated sludge process without diluting the sewage. On the other hand, the sprinkling filter continues to function without showing like symptoms of distress.

There appears to be considerable information available on the handling of industrial wastes as such in the experimental work by the U. S. Public Health Service, by the Sanitary District of Chicago, and by the Massachusetts State Board of Health and other state agencies. There is, however, a rather meager fund of experience available as to the behavior of apparatus in different industries, and even fewer data upon the behavior of biological process in such circumstances. Further, in the application of sewage treatment on municipal problems, the proportion of industrial waste has not always been closely estimated, but has to be approximated. Use of the more modern methods of sewage analysis should encourage investigations in this field and more complete estimation of the loading coming from different types of industry expressed in oxygen demand per unit of production. With better knowledge of the behavior of biological sewage works based on a similar type of test, it is probable that the performance of sewage works can be estimated much more accurately in the future than has been the case in the past.

Acknowledgment.—From a paper read before the American Society for Municipal Improvements at Boston, Mass.

Garbage Collection and Disposal in Dayton, Ohio

THE garbage of Dayton, Ohio, according to the latest annual report of the city, issued June, 1924, was removed during the year at a total cost of $54,634.40, which is $2,185.45 greater than the cost for the previous year. For this, 416 cars, or 24,370 tons, of garbage was collected, which is 17 cars more than was collected in 1922. The collection cost per ton was less for 1923 than for the previous year, being $2.24 as against $2.37 per ton. Of the 416 cars, 355 cars were shipped to the garbage reduction plant, and 61 cars hauled to the Workhouse Farm Piggery.

The garbage reduction plant disposed of 17,550 tons of green garbage during the year. Through the reduction of this garbage, 923,565 pounds of grease was recovered and 1,155 tons of tankage produced. This means that for each and every ton of green garbage reduced there were 52.62 pounds of grease and 131 pounds of tankage reclaimed. To cook, press and dry the garbage and reclaim the gasoline used, it required 2,638 tons of coal, which is a ton of coal for every 6.6 tons of green garbage. The gasoline lost in the recovery of the greases amounted to 9,463 gallons, only is 0.54 gallon per ton of green garbage.

Are You Behind the Movement for Adequate Playgrounds?

If So, How Far Behind?

By Walter B. Evans

THERE are but few people in these days who are not in full sympathy with the movement for better play facilities for the children of the nation. There are many reasons for this.

First, the recognition that play is a necessity to the children—not merely a childish desire which may be baffled without harm being done.

Second, that clean, invigorating play develops clean, vigorous children; and contrawise that alley and street play naturally develops minds warped by the influences of such unwholesome and dangerous environments.

Third, that juvenile delinquency decreases in direct ratio to the number of supervised and well-equipped playgrounds established, and vanishes almost entirely where the whole field is covered and the program comprehends the entire twelve months of the year.

Fourth, that modern life has given little thought to the child. Open spots (natural playgrounds) are built upon; large barns are replaced by the two-by-twice variety of family garages; and home yards have ceased to satisfy the child's craving for play, even where yards still exist.

Fifth, the terrible child mortality list resulting from compelling children to find their fun on the busy thoroughfares.

Sixth, the significant fact that modern life has created modern children who expect and demand more and better play facilities.

Seventh, that we are fast becoming a sedentary people and that, if we are to hold fast to health and strength, we must feature the means for keeping them.

Eighth, that the right kind of play or recreation must comprehend both mind and body; that play be high-minded and clean; that it encourage thoughtfulness and respect for the rights of others; that it teach loyalty, obedience, cöoperation, sacrifice, and fair play, as well as develop the body through healthful, safe, invigorating exercise, and teach coordination of mind with body.

The full recognition of these beneficial results of a well-developed play program will remove entirely the opposition which now exists; and the cost of such a program will assume its place in school, city and county budgets, as street paving and bridge building do at the present time.

The outstanding fact in comparing values, as between child life and paving or bridges, is that paving or bridges can be replaced at an outlay of money, while child life, besmirched and turned into wrong channels, is a liability on society which millions of treasure and years of effort cannot restore.

What, then, if better play facilities are so necessary, should be furnished to insure them?

First, play spots must be obtained. School yards are usually available, but other spots in addition should be secured.

Second, to secure best results, playgrounds should be supervised by competent persons, in thorough sympathy with child aspirations and reactions to influences.

Third, each playground should be equipped with safe playground apparatus of beauty, durability, and playability, so that each child may find just the type of fun he craves.

Fourth, miscellaneous games, other than the use of apparatus, should be encouraged. The supervisors should enter into the spirit of the game and, by example, show the best way to play it.

Fifth, winter sports should be encouraged.

These, in brief, are the steps to take. Now, any play program requires money—and this is the rock upon which many wreck their humanitarian projects—but the securing of money, from public funds or voluntary contributions, is not so difficult, if the right steps are taken.

To sum up, briefly: Children must and will play. Their play will grow either good or bad men and women. This lies in the keeping of the adults.

Tears are shed over young lives which seem to have slipped their moorings, but shed tears will never replace ruined youth; nor will they make impossible the recurrence of such calamities, unless coupled with a determination to stop them by the use of the most effective methods of preventing them, among which are *well-equipped and supervised playgrounds.*

What Is the Thing Yclept Community Spirit?

FROM time to time we hear mentioned "community spirit," "spirit of progress," "civic pride" and other names. They are, after all, one and the same thing. But what is this thing?

Briefly, it is the thing that caused the city to convert the old town pump into a modern waterworks; the old hose-cart into a modernized and motorized fire department; the muddy streets into hard-surfaced boulevards; the lanes into beautiful streets; the old county court-house into a beautiful specimen of architecture.

The old pump may have been good enough for the people of its day; the horse and buggy may have served its purpose; and the tin dipper may have satisfactorily watered thousands of school children; but who would like to go back to that period? The community spirit has erased the unsightly and unsanitary conditions of a decade ago.

You may have gone to school and sat on a split-log bench, but you would hardly care to have your children do that. Why? Because the community spirit has moved us to build beautiful schools that are attractive, comfortable and convenient. We realize that no community can exist long without schools in which to train the citizens of coming generations.

Have you ever noticed that almost any man will brag about his home town when he is away from it? He may be the most devout knocker in the city and go out of the way to knock, at home, but he's different when he is in some other man's town. It is that something within us called the "community spirit" that brings out this love for our home town.

We would say, then, that community spirit is the force within us which builds cities where no cities existed before and which day by day improves the city. Where you find the strongest community spirit, you will also find the best city in which to live, whether it be a small hamlet or a giant industrial metropolis.

—SIOUX CITY SPIRIT OF PROGRESS.

The Real Producers of Public Sentiment

THE wind that fills the sails of yon square-rigged ship and carries her so gracefully over the billowy deep was not produced on board the ship by the captain or the crew, but by forces and powers outside and independent of both crew and ship. The crew merely set her sails gain the power of the wind. So with a political party, the politicians merely set their sails to gain the power of public sentiment. The forces that produce public opinion are outside and independent of political parties. These forces are the educational activities of all kinds—they are the real producers of public sentiment, and all progress is due to them, and all honor and credit is due to the unselfish souls who carry on the work of developing correct thought in the minds of the citizens of the community.

—JAMES R. BROWN.

Civic Cooperation in the International Golden Rule Campaign

By Mabell S. C. Smith

Last year people in fourteen nations ate the symbolic meal that united their thoughts on the Golden Rule. This year, on Sunday, December 7, there will be twenty-three tongues spoken over the dinner tables of the world. Here in the United States, where rests the heaviest responsibility to support the children on whom will rest the peace and progress of the Near East of their generation, a clear call rings out to every civic organization in the country to do its share to make the day successful.

THE campaign to interest the United States in the observance of Golden Rule Sunday for the benefit of the war orphans maintained by Near East Relief was put on for the first time in the autumn of 1923. Although it covered a period of only two months, it swept the country in a remarkable way. No part was more surprising than the cooperation of city officials and civic bodies.

The plan of observance as outlined at a Geneva gathering of the International Near East Association was the meeting at a common dinner-table all over the world of people willing to eat the simple foods served every day to the children in the Near East orphanages and then, with imaginations alive to the difference between the lot of these friendless youngsters and their own sheltered little ones, the giving of a thank-offering from their own abundance.

Such a plan, with its under-suggestion of a spiritual and material audit, might be supposed to take with church people and with folk accustomed to giving to philanthropic causes. It did. But it also hit the fancy of a myriad of people unused to introspection or to the making of donations to foreign needs. Of the thousands upon thousands of contributors to the Golden Rule fund of Near East Relief, 75 per cent were new subscribers.

MAYOR DEVER, OF CHICAGO, SIGNING HIS APPROVAL OF THE OBSERVANCE OF GOLDEN RULE SUNDAY

Naturally, a big impetus was given to these new givers by the endorsement of the country's leaders. President Coolidge sent a letter of appreciation. So did the late President Wilson, members of the Cabinet, many senators, governors and mayors, who expressed approval of the plan and agreed to eat the dinner. Editors, heads of Granges, bank presidents, all influenced their constituents to make a practical application of the Golden Rule. The list of approving organizations includes groups of such hard-headed and supposedly unemotional business men as the Kiwanis, Rotary, Lions and Civitan Clubs.

Among the mayors, Jacob Thompson of Ephraim, Utah, pointed his appeal to the representatives of civic organizations by giving his own cheque for $5,000. Mayor Sehring of Joliet, Ill., Mayor Shank of Indianapolis, Mayor Morton of Knoxville, Tenn., and Mayor Cahill of Watertown, N. Y., issued proclamations stating the distress of the children and recommending a day of Golden Rule observance by meditation and practice. Other city heads, as Mayor Quinn of Louisville, gave out letters urging the bitter need overseas upon the attention of citizens. These examples, taken at random, show that the call reached all parts of the country.

Of the thousands of Golden Rule luncheons and dinners eaten for the good cause, many were turned into mild festivities. One business men's luncheon club saved money not only on the food but on the service, white jackets turning grave merchants into more or less skilful waiters. A group of Lions in North Carolina "ate hearty" on bread, raisins and a glass of water. A Kiwanis club in California sold and re-sold a huckleberry pie until it netted $60.

But underneath the gayety lay a profound sympathy for the little children whose housing and daily food depend upon the application of the Golden Rule. America saved the lives of many thousands of these youngsters and now is training them for self-support in the lands that have given them shelter. She is educating the economic leaders of the future. She is also doing her part to help on the day when the old misunderstandings in the Near East will give way to a kindly feeling that will make wars difficult or impossible.

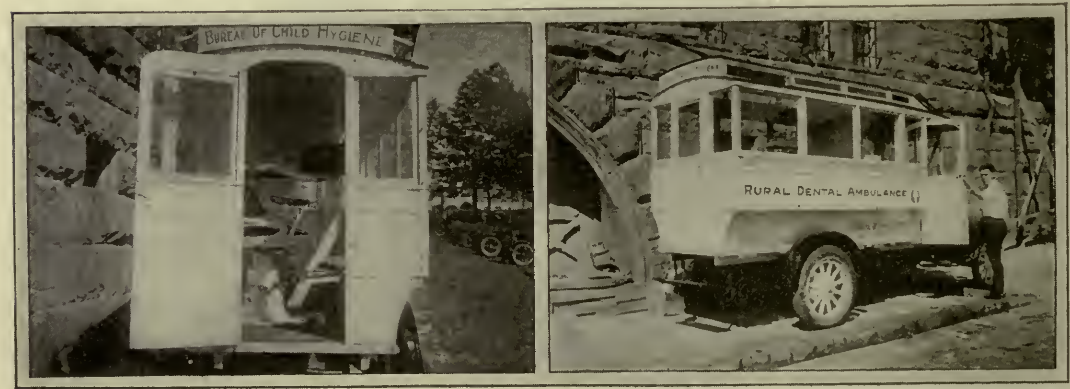
A County Dental Clinic Ambulance

THE operation of a rural dental clinic ambulance is a noteworthy addition to the activities of the Bureau of Child Hygiene of the State Department of Health of New Jersey, of which Dr. Julius Levy is consultant. This motor vehicle, fully equipped with modern dental apparatus, is sent into outlying communities throughout the state to teach oral hygiene and to correct dental defects among the school children. In this work the Bureau has the close cooperation of the school authorities.

Before sending the ambulance into a community, the Bureau endeavors to show the need for a program of this kind by medical inspections in the public schools and by the follow-up work of the child hygiene nurses. Arrangements are then made for a demonstration with the ambulance; the children are examined, and those who are unable otherwise to afford dental service are cared for at a nominal cost by the clinic dentist. The responsibility for the up-keep of the vehicle and the salary of the dentist is assumed by the community in which the ambulance is operating. The value of the work accomplished by the traveling clinic is recognized by many local dentists, some of whom have proved their interest by contributing dental supplies.

During the year 1923 the ambulance spent its entire time among the remote sections of Burlington County, with the exception of a two weeks' visit to Ocean County. The extent of the service rendered through the clinic in those two counties during the year is shown by the following table:

County	Children Treated	Treatments	Extractions
Burlington	2,545	1,803	1,062
Ocean	85	241	135



RURAL DENTAL AMBULANCE OPERATED BY THE BUREAU OF CHILD HYGIENE OF THE NEW JERSEY STATE DEPARTMENT OF HEALTH

New Water-Supply for Tulsa, Okla.

ON October 19 the last length of concrete pipe was laid in Tulsa's big Spavinaw pipe line. This completes 55½ miles of 60- and 54-inch concrete conduit from Spavinaw Lake in the Ozarks to the storage reservoir outside the city. This project, which cost $7,500,000, was finished in almost exactly two years from the letting of contracts. Approximately 50 per cent of the contract for the manufacture and laying of the concrete pipe has been completed in the last nine months, since the time when the Walbridge-Aldinger Company abandoned its contract and the Water Commission took over the work, to be finished under the direction of its engineer, W. R. Holway. This part of the work included three difficult river crossings, and it was on the bank of the Grand River, the most troublesome of these rivers, that the last pipe was laid. On November 17 the city expects to celebrate the turning of the water into her mains and rejoice in the possession of one of the best water-supplies in the Southwest.

A New Large Municipal Water-Tower

Details of Steel Structure Just Completed for San Diego, Calif.

By Allen H. Wright

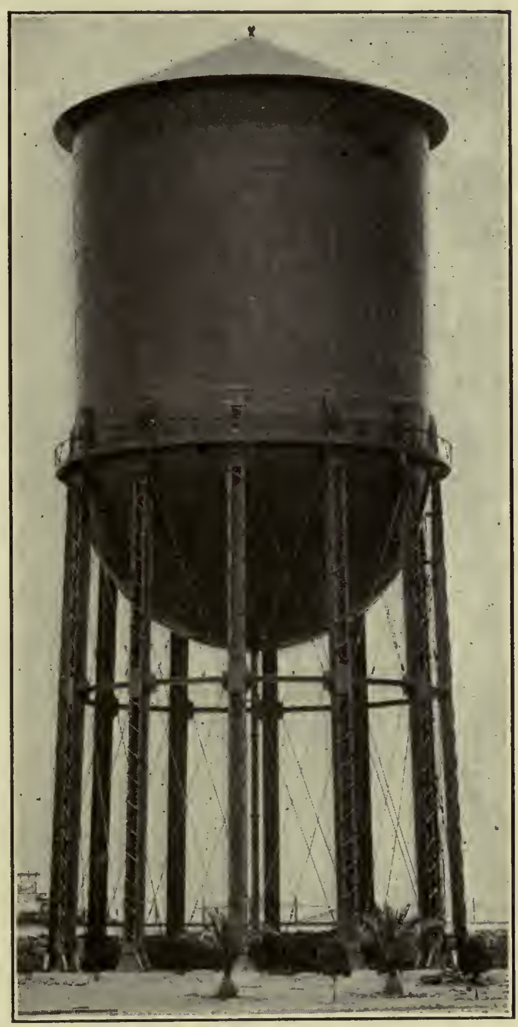
ONE of the largest elevated tanks ever built for municipal service has just been finished in San Diego, Calif. The tank, which has a capacity of 1,202,000 gallons, was provided for by a municipal bond issue, as its construction was felt to be necessary to afford sufficient pressure for the service in a section of the city where the elevation was such that additional storage under pressure was needed.

The proposals for the work required each bidder to furnish complete plans and specifications and also required that the height from the ground to the bottom of the tank should be 50 feet and that the tank should have a capacity of at least 1,200,000 gallons. Bids were submitted by a number of manufacturers, each with a different design. The bid of the Pittsburgh-Des Moines Steel Company was accepted, as it was lowest and seemed best adapted to local conditions. The tank is 54 feet in diameter and is 52 feet 3 inches high. The tank bottom is 50 feet above ground level, and the hemispherical bottom drops 27 feet below the balcony. The total height of the structure from the top of the foundation to the top of the overflow is 127 feet 5½ inches.

The tank is supported by twelve columns, each sloping inward slightly to add stability. The columns are riveted to the tank cylinder at the balcony line, and the entire load of 5,000 tons of water is carried by the twelve columns around the perimeter of the tank, there being no support directly underneath the tank. The large hemispherical bottom, which is 54 feet in diameter, hangs from the tank shell at the balcony line where the columns are connected. Each of the twelve columns carries a load of approximately 417 tons of water, as well as the weight of the steel and wind load.

Each column is supported by a concrete pier 12 feet square at the bottom, 6 feet square at the top, and about 9 feet deep. The depth is variable because of the various depths of the hard-pan to which the foundations were carried. The twelve piers form a perfect circle 61 feet 7½ inches in diameter on centers.

About 400 tons of plates and structural shapes were used in the construction of the tower, as well as about 40,000 large rivets, 13,900 of which went into the hemispherical bottom. The tank is roofed with 3/16-inch steel. In order to eliminate as far as possible any chance of settlement in the piers or other parts of the structure, extreme care was taken in the construction of the foundation, especially in the determination of the bearing value of the soil.



COMPLETED WATER-TANK AND TOWER, SAN DIEGO, CALIF.

The structure in its completed state gives the city of San Diego a much needed elevated water storage and stands unique in the field of municipal water-works storage tanks. The contract price for furnishing all materials and constructing the tank was $69,150.

Chamber of Commerce Activities in Public Affairs

The New Bayshore Boulevard, Tampa

TAMPA, FLA.—When the tropical hurricane of October 21, 1921, had passed through Tampa, Fla., Bayshore Boulevard, along the unprotected water-front, was a tangle of uprooted trees, prone telephone, electric and trolley poles, twisted wires and uptorn pavement, almost impassable even on foot. Less than a month later the Tampa Board of Trade received the first suggestion of a greater and more beautiful Bayshore Boulevard, more than a hundred feet wide, with one-way drives, with beautifully planted parkways on each side of the double street railway tracks, and the whole protected by a wall of reinforced concrete strong enough to withstand the most severe attack of wind and water.

Three years have brought the plan to its final stages. Contracts have been awarded for the dredging preliminary to construction of the sea-wall, and the work is under way, to be completed, according to estimates, within a year and a half.

The first suggestion made officially for extension of the city's original concrete sea-wall from its termination at South Rome Avenue to Ballast Point, a distance of about three miles, was made by Alfred W. Perkins, then President of the Tampa Board of Trade. At a meeting of the board of governors of the Board of Trade held on November 9, 1921, less than a month after the disastrous storm, Mr. Perkins urged the governing body to take up at once plans for constructing a solidly built reinforced concrete sea-wall, and in connection with it a driveway commensurate with the beauty of the magnificent body of water it should skirt, and of its wonderful tropical setting. From that suggestion grew the Board of Trade's sea-wall committee.

Several years earlier a beginning had been made on the beautification of a part of the bay frontage in the residential section of Tampa. A concrete sea-wall was built along all that was then developed of this water-front, with a 50-foot paved drive, cement sidewalks, and ornamental electric light standards spaced along the wall. Planting of the parkways between the sidewalks on the property side and the street, however, was not undertaken systematically, and the heterogeneous, hit-or-miss effect usually following individual effort resulted. Palms of several varieties, water oaks, Australian pines and oaks, a few royal poincianas, and even a number of sea grape bushes—wild plants native to salt marsh borders in South Florida—all were jumbled together in the space of less than two miles. Even this ill-chosen mixture, however, could not destroy the natural beauty of the drive, enhanced by the engineering work included in the construction of the sea-wall and boulevard, and to-day some of the handsomest homes and grounds in Tampa fringe this drive along the upper portion of the bay.*

The new drive is 137 feet wide from property line to sea-wall face. Ample opportunity is afforded in this broad stretch for two one-way drives with wide parkways on each side, and for the double tracks of the electric street railway in the center. Full use is to be made of the habit of the coconut palm of thriving best when its roots can reach salt or brackish water, and scores of these graceful trees are to be planted along the water frontage, in short rows or in clumps and groups. The flame of hibiscus, the orange glow of royal poinciana above the finely cut, velvety foliage of the tree itself, the azure of plumbago, the scarlet flash of poinsettia, Florida's most gorgeous winter bloom, with long, broad expanses of emerald grass, and the blue of Florida skies blend in a marvelous picture.

In all this stretch not a jarring note is to be permitted; the contract with owners of property, under which the entire project was undertaken and is to be carried out, particularly safeguards against that. Only such boat-houses and their necessary piers are to be built along the sea-wall as will conform to the general plan. The sea-wall and the broad boulevard it is to protect are designed to follow closely the windings and indentations of the shore line. Nor does the plan contemplate cuts or fills to hold the driveway down to a certain grade, but full advantage is to be taken of the not numerous gentle rises and dips in a manner that will relieve the boulevard of the monotony of a dead level. Property fences or walls are not to be removed or set back and no frontage is to be taken from abutting property for boulevard purposes. In other words, in return for their signed agreement sanctioning the entire project and guaranteeing preservation of the beauty of the new Bayshore Boulevard by refraining from erection of any unsightly structure along the water frontage, property owners are insured against encroachment on their residential properties in the construction of the boulevard. This is an original provision devised by the Board of Trade's special committee and attorneys and the county authorities for the perpetual protection of property owners in return for their protection of the water-front.

Provision that not more than thirteen streets or avenues shall ever enter the new boulevard, and that distances between these avenues shall be not less than a thousand feet, is another safeguard designed to preserve the beauty and continuity of the whole plan. Waiting-stations that are to be placed by the electric street railway company at street intersections are to be of design, materials and construction that will harmonize with the beauty and dignity of the whole conception.

Present residential development along the bayshore is of a character that assures maintenance of the highest standards, and this assurance is strengthened by the high and steadily advancing values of the few remaining parcels of unimproved realty fronting on that portion of the bay to be skirted by the sea-wall and boulevard.

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*See the front cover of this issue.

Ultimately the boulevard is to be linked up with another drive that will follow the Hillsborough River from its mouth to a point many miles up the winding watercourse. Connecting with this drive are others already built, and still others to be constructed, all bordered with palms and oaks and pines, hibiscus and oleanders and other tropical growth. Hillsborough County already has its highway-beautification commission, organized and functioning. Work has been started on the beautification of several of the county's most important arteries of travel. Beautiful Memorial Boulevard, built in memory of Tampa's war heroes, is the charge of the Tampa Rotary Club, and its length of fourteen miles has been planted on each side with oleanders and oaks. But of all the beautification work in the county now under way none possesses such potentialities of loveliness and utility as the new Bayshore Boulevard.

L. P. DICKIE,
Managing Secretary, Tampa Board of Trade.

A Bond Issue Which Awakened a City

MONROVIA, CALIF.—This southern California city of about 11,000 people, largely of the retired class, has for most of its thirty-eight years been indifferent or antagonistic to any comprehensive plan of civic development. About a year ago the need for various public improvements became very apparent, and the question of their accomplishment was discussed at a meeting of the Directors of the Monrovia Chamber of Commerce. As pointed out at that time, the average citizen can be trusted to think right and act right in civic affairs if he is shown that he owes a civic duty to his community, and a program of civic education was decided upon as a necessary step before placing any proposals before the citizens.

A Citizens' Committee, made up of the presidents of every civic, fraternal, social and luncheon club in the city, a member of the City Council, and the President of the City Planning Commission, with the President of the Chamber of Commerce as Chairman, was first appointed to survey the needs of the city. After two months' study, a recommendation was made to the City Council that the following bond issues be placed before the voters at a special election: new city hall, $60,000; water, $180,000; park development, $80,000; bridge project, $16,000. The Council, amazed at first, finally agreed to the entire proposition with the exception of the city hall item, which it lowered to $50,000.

THE FALLS IN MONROVIA, CALIF.

The water system is municipally owned, and with the completion of the present municipal improvements the water-supply will exceed present demand by 33 per cent

To carry out the plan of civic education, a speakers' bureau composed of able and public-spirited citizens was organized. At every opportunity these men spoke before lodge meetings, clubs, etc., carefully explaining the proposed projects and stressing civic duty. Extensive newspaper publicity was employed, and in addition every voter was personally solicited and his attitude on the coming election card-indexed and filed.

The election over, the town awoke to the fact that all of the bonds had carried, with the excep-

tion of the park project, which lost by three votes. Determined to carry this item too, the Citizens' Committee initiated a petition for another election on this project, and at the same time undertook to carry a school bond issue for $125,000. Both of these items were approved at the second election, making a total of $451,000 in bonds in a town that had been bond-shy for over thirty years.

With a real community spirit aroused, it was not difficult later to put over a drive for $138,000 for a community hotel and $80,000 for a country club. Real estate values are rising, we have gained 1,500 population in one year, and new industries are being established.

HARRY F. SCOVILLE,
City Manager.

For a Well-shaded Road to Dallas

DALLAS, TEX.—The members of the Dallas Junior Chamber of Commerce during the past two years have taken an active interest in beautifying the highways leading into the city by planting shade trees. At the organization's second annual tree-planting day, held in the early part of this year, a group of the members undertook to add five hundred American elm trees to the row of two hundred and eighty trees planted by the Junior Chamber along the Dallas-Fort Worth Pike last year. These trees, which were all six feet tall when planted, will, when fully developed, help to make this road one of the most attractive, well-shaded driveways in the state.

MEMBERS OF THE DALLAS JUNIOR CHAMBER OF COMMERCE WHO PLANTED 280 ELM TREES ALONG THE DALLAS-FORT WORTH PIKE

City Forester W. B. Woodruff and his assistant were on hand to supervise the planting and trimming of the trees, and County Commissioner George W. Ledbetter, who also joined the gathering, provided the men with the necessary equipment, including a water-truck for watering the trees after planting. In a friendly spirit of rivalry the workers vied with each other in the matter of speed combined with efficiency, and the entire piece of work, which was started at two o'clock in the afternoon, was completed within four hours. The crowd then left by automobiles en route for the little town of Grand Prairie, where a welcome chicken dinner, prepared by the women of that community, awaited them. Here the workers were thanked by a member of the Grand Prairie Chamber of Commerce and other citizens of the town for their contribution towards the improvement of the highway.

Of the trees planted last year, sixty-seven died, as a result, it is believed, of injuries from passing automobiles. These have been replaced this year, and we have sought to avoid a recurrence of this difficulty by the erection of a large sign on the pike giving credit to the Junior Chamber of Commerce for the planting of the trees, and urging motorists to keep on the pavement.

The avenue of trees planted by the Junior Chamber now extends for a distance of three miles, the trees having been placed about forty feet apart along both sides of the highway. We shall continue this work next year, and in addition shall endeavor to arouse the interest of other civic organizations in tree planting along the other highways of Dallas County. We also plan to seek the cooperation of adjoining counties in continuing the work on their side of the line.

THEODORE E. JONES,
Secretary, Dallas Junior Chamber of Commerce.

Industrial Survey Under Way in Cincinnati

CINCINNATI, OHIO.—The Cincinnati Chamber of Commerce has retained the Technical Advisory Corporation, consulting engineers, of New York, to conduct an industrial survey of Cincinnati and its environs and to prepare a plan for the industrial development of the city. The work has already been started and it is expected that it will be completed within eight months.

The purpose of the survey will be to provide a workable method of expanding and controlling Cincinnati's industrial and commercial development to the best advantage of her people. To this end, a detailed study will be made of the following factors:

History and Geography
Zone of Influence
Meteorology
Natural Resources
Consuming Power
Agriculture and Food Supply
Population
Labor Supply
Housing
Living Costs
Raw Materials
Imports and Exports
Capital and Banking
General Business
Transportation
Freight Rates
Handicaps to Development
Industrial Advantages
Present Industries
Industrial Relations
Industrial Balance
Desirable New Industries
Marketing of Products
Public Service
Effect of City Planning
Competing Cities

The results of the studies of the individual factors will be coordinatel in a general study of all existing conditions and possibilities. The coordinated study will be the basis of a plan for general industrial development and trade improvement. This plan will show what should be done to overcome present handicaps, improve unfavorable existing conditions, and fully capitalize Cincinnati's advantages and resources. It will show what steps should be taken toward the fullest cooperation on the part of all interested organizations; what new industries are needed or can best be supported; what should be done to secure better industrial plants; how Cincinnati's industrial advantages and desires can best be made known to the world; and what part the Chamber of Commerce should take toward the creation of a greater, better and more prosperous Cincinnati. It will include a development program for the guidance of the Chamber of Commerce in carrying out its work toward these ends.

WILLIAM C. CULKINS,
Secretary, Cincinnati Chamber of Commerce.

How Chambers of Commerce Can Aid the Post Office Department

By Harry S. New

Postmaster General

THE notable improvements of recent years in the postal service throughout the United States can be further advanced by the cooperation which local chambers of commerce and other civic organizations have it in their power to render to the Post Office Department. Here are a few suggestions for such aid:

Early Mailing Campaign

An extensive effort has been made throughout the country to have the public mail early and more frequently, to avoid congestion of work in post offices at the end of the day. Considerable progress has been made in getting the public to follow this practice, with the result that mail has been handled more expeditiously, often with the saving of an entire day in the time required for delivery at destination; and the amount of night work at post offices has been reduced, with consequent benefits to postal employees and their families. In one post office alone the postmaster was able to transfer 56 employees from night work to the day crew. By repeated emphasis on the importance of early mailing to all concerned, local organizations can render an important service.

Hotel Mail

The traveling public has been noticeably benefited by the Department's instructions for the handling of hotel mail. To obviate the formerly haphazard way in which this class of mail was handled, we issued detailed instructions requiring, among other things, the inspection of hotel mail at least every ten days. Postmasters have secured the cooperation of hotel managers, and proper systems have been installed in many of the hotels of the country. If your local hotels are not up to date in this matter, your postmaster will be found ready to cooperate to that end.

Postmasters in Civic Affairs

Recognizing the importance of the postmaster in his community, all postmasters have been urged to participate in civic affairs as a necessary part of their duty as postmasters. They have been urged to avail themselves of every opportunity to secure the cooperation of civic organizations in the observance of fundamental principles of mailing and to bring the various facilities of the postal service to the attention of the public. It is suggested that local organizations do not hesitate to ask their postmaster for such civic service as he may properly render.

Instruction of School Children

Postmasters all over the country are conferring with local school authorities with a view to adopting the most effective method of instructing school children as to the organization and operation of the postal service. Moving-picture films instructing the public as to proper methods of addressing mail are available for showing in schools and theaters. Have your schools and motion-picture houses profited by this educational opportunity?

Combating the Swindling of the Public Through the Mails

An energetic campaign, prosecuted to protect the public from the operation of hundreds of new and unique swindling schemes, has resulted in the arrest of a large number of persons during the present administration, with convictions in many instances. While it is impossible to estimate the amount of money which would have been collected by these fraudulent concerns had they been allowed to continue to operate, the magnitude may be realized when it is stated that between $75,000,000 and $100,000,000 were mulcted from the innocent victims during one year by the schemers before their arrest and conviction. Chambers of commerce are in a strategic position to learn of fraudulent schemes of this kind, and to report them to the post office authorities.

Better Mail Service to Convention Delegates

Delegates to conventions and other meetings are being given better mail service as the result of instructions to postmasters to keep accurate checks on such assemblies and to make unusual efforts to deliver mail to visitors attending them. Your local postmaster should be kept constantly informed in advance of the coming of conventions to your city.

Complaints and Suggestions

If the postal service in your city is not wholly satisfactory, the proper procedure is not merely to grumble about it, but to discuss in a friendly spirit, with your local postmaster, the improvements desired. You will almost certainly find him ready to do what he can to meet any reasonable request, or to refer to Washington any complaints which are beyond his power to remedy. But if this procedure does not bring the results desired, the Postmaster General will give prompt and careful consideration to any communication which a responsible local organization may send to him.

Fifth Avenue's Centennial

FIFTH Avenue will be 100 years old in November. And all New York and the world will know it too.

President Coolidge, Governor Smith and Mayor Hylan have accepted honorary chairmanships of committees, and the recognition by nation, state and city of the centenary of Fifth Avenue's founding stamps this celebration as a great civic event.

The week of November 15 to 22 has been set aside to honor Fifth Avenue, which was established on the city map on November 1, 1824. The official opening of the Avenue was approved at a meeting of the Common Council of the city of New York on September 27, 1824. The avenue ran from Art Street, approximately the location of the present Washington Square, to 13th Street, a distance equal to about six present-day city blocks. The metamorphosis of Fifth Avenue from a dirt path to a model of civic beauty, the center of wealth and fashion, will be revealed in the Centennial celebration. There will be an educational and inspirational panorama of the Avenue's growth from a short country lane to the magnificent and stately thoroughfare that it is to-day, the show-window of New York, America and the world. The shops and great department stores in their window and interior displays will mirror 100 years of the development of art and industry. The public and parochial school systems of the city will observe the occasion with fitting exercises and with essay and poem competitions for which prizes are offered by The Fifth Avenue Association. The high schools will give pageants depicting the evolution of history and tradition, and one of the central features of Centennial Week will be the annual dinner of the Association, to be held on Thursday, November 20.

A Centennial History is being published under the auspices of The Fifth Avenue Association, to trace the 100 years of Fifth Avenue's development. The cover design was selected in an international prize competition, and the book itself will portray in text and pictures an accurate and complete record of the Avenue's colorful history. The Centennial volume will show for the first time how the expansion from a rural highway to a national symbol has been shaped and conditioned by civic interest, expressed through organized effort, and that the constructive influences that have made the new Fifth Avenue were centralized in The Fifth Avenue Association formed in 1907, at a time when destructive forces were without a check either in law or in public opinion. The record shows that with organized vigilance and civic effort, any city or community can play a large part in shaping its own character and in promoting its own development.

WILLIAM J. PEDRICK,
General Manager, the Fifth Avenue Association, Inc.

County Grants 675 Acres to City for Public Playground

THE city of Savannah, Ga., will shortly acquire through an indefinite grant and without cost, 675 acres of land within a mile of the city limits to be developed into a public playground. The land is being turned over to the city by the county of Chatham for the express purpose of golf course and other recreational developments. The stipulation by the county is that the city of Savannah, in return for receiving the land gratis, shall bear the expense of improving the land and shall keep up the recreational features from year to year.

Four 18-hole golf courses are projected on this land, the first one to be ready within a year. Other features will include a public park of 90 acres, polo field, tennis courts, baseball grounds and race-track. This development, which will require about three years for completion, will give Savannah one of the finest and largest recreational centers in the South, and will offer special attractions to tourists and other visitors. The project was started last spring by the Savannah Board of Trade, and received the immediate cooperation of county and city authorities.

NELSON T. STEPHENS,
Secretary, Department of Publicity, Savannah Board of Trade.

The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

Purposes for Which the City Taxing Power May Be Used

"THE power of taxation is one of the highest attributes of sovereignty," declared the Indiana Supreme Court in the case of Hart vs. Smith, 64 Northeastern Reporter, 681. As such it ordinarily vests in the state legislature. A city has no right to levy and collect a tax except as authorized by the legislature. It has no powers excepting those given by statute or charter, in express terms or by necessary implication, in aid of express powers. (North Carolina Supreme Court in the case of Edgerton vs. Goldsboro Water Company, 35 Southeastern Reporter, 243.)

In the last cited case, it was held that, although authorized by its charter to provide water for its inhabitants, the cost was not a "necessary expense," within the meaning of a clause of the local constitution, prohibiting a city from levying taxes without assent of a majority of the qualified electors, excepting for necessary expenses.

An official syllabus by the Georgia Supreme Court reads:

> "Municipal corporations can levy no tax, general or special, upon the inhabitants of the municipality or upon the property therein, unless the power to do so be plainly and unmistakably conferred upon them by the state. . . . The burden is upon every political division of the state, which demands taxes from the people, to show the authority to exercise it in the manner in which it has been imposed."

Referring to a statutory limitation upon the powers of Illinois cities, the Supreme Court of that state said in the case of People vs. Chicago & Eastern Illinois Railway Company, 138 Northeastern Reporter, 127:

> "A city can levy no tax except by virtue of a statute. Every tax which the city council is authorized by law to levy is for some specific purpose, and section 1 of article 8, which contains this limitation, requires the ordinance making the levy to specify in detail the purpose for which the appropriations are made and the amount appropriated for each purpose."

Of course, power to tax may be conferred directly upon cities by constitutional provision. What has been said above presupposes existence of the ordinary situation, where all taxing and legislative powers have been conferred primarily upon the state legislature. To illustrate, it was held by the California Supreme Court in the case of Security Savings Bank vs. Hinton, 32 Pacific Reporter, 3, that a constitutional provision enabling certain cities to adopt home-rule charters, vested in such cities, by necessary implication, the taxing power essential to municipal existence. On the other hand, it was ruled by the Missouri Supreme Court in the case of State vs. Van Every, 75 Missouri Reports, 530, that a constitutional provision, limiting municipal tax rates, conferred no taxing powers on cities and towns. It merely operated to limit exercise of such powers conferred by legislative act.

In the case of Lowell vs. Boston, 111 Massachusetts Reports, 454, the Massachusetts Supreme Judicial Court applied the now well-settled principle that only a public purpose will support the power of taxation by a municipality, despite attempt by the state legislature to confer broader power. In that case it was decided that defendant city could not bond itself to provide loans for rebuilding privately owned structures destroyed in the fire of 1872. The Court said:

> "To justify any exercise of the power requires that the expenditure which it is intended to meet shall be for some public service, or some object which concerns the public welfare. The promotion of the individual, either in respect of property or business, although it may result incidentally in the advancement of the public welfare, is, in its essential character, a private, and not a public object. However certain and great the resulting good to the general public, it does not, by reason of its comparative importance, cease to be incidental. The incidental advantage to the public or to the state which results from the promotion of private interests and the prosperity of private enterprises or business does not justify their aid by the use of public money raised by taxation, or for which taxation may become neces-

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sary. It is the essential character of the direct object of the expenditure which must determine its validity, as justifying a tax, and not the magnitude of the interests to be affected, nor the degree to which the general advantage of the community, and thus the public welfare, may be ultimately benefited by their promotion. The power of the government, thus constituted, to affect the individual in his private rights of property, whether by exacting contributions to the general means, or by sequestration of specific property, is confined, by obvious implication as well as by express terms, to purposes and objects alone which the government was established to promote, to wit, public uses and the public service. This power, when exercised in one form, is taxation; in the other, is designated as the right of eminent domain. The two are diverse in respect of the occasion and mode of exercise, but identical in their source, to wit, the necessities of organized society, and in the end by which alone the exercise of either can be justified, to wit, some public service or use. It is due to their identity in these respects that the two powers, otherwise so unlike, are associated together in the same article."

Following the limitation laid down by the Massachusetts court, the North Dakota Supreme Court ruled in the case of Manning vs. City of Devils Lake, 99 Northeastern Reporter, 51, that defendant city could not utilize the taxing power to provide a bridge for the convenience of inhabitants of a district lying outside the municipal borders, although that would promote the commercial interests of the city.

July 29, 1924, the Oregon Supreme Court handed down a decision (Capen vs. City of Portland, 228 Pacific Reporter, 105) which indicates the full lengths to which the courts have gone in upholding taxable purposes. In that case it was decided that golf links constituted such "public utility" as to authorize a bond issue, under charter authority, although stress was laid by the Court on the point that the bonds were to be paid, not through public taxation, but through fees collected from those using the links. The Court said:

"We find in the text-books no exact definition of a public utility; in fact, it would be very difficult to construct a definition that would fit every conceivable case. It has been frequently held that the words 'public utility' are synonymous with 'public use.' . . . In 19 R. C. L. p. 721, defining the powers of municipal corporations, the following language is used:

"'Municipal corporations are not limited to providing for the material necessities of their citizens. Under legislative authority, they may minister to their comfort, health, pleasure, or education. They are not limited to policing the city, to paving the streets, to providing it with light, water, sewers, docks, and markets. The power of cities and towns to maintain institutions which educate and instruct as well as please and amuse their inhabitants, such as libraries and botanical and zoological gardens, is unquestioned. So also the public funds may be expended in providing an exhibit at a fair or exposition. The reasonable use of public money for memorial halls, monuments, statues, gates or archways, celebrations, the publication of town histories, parks, roads leading to natural scenery, decorations upon public buildings, or other public ornaments or embellishments, designed merely to promote the general welfare, either by providing fresh air or recreation, or by educating the public taste, or by inspiring sentiments of patriotism, or of respect for the memory of worthy individuals, has received such general sanction that there can be no doubt that municipal corporations may be constitutionally authorized to expend money raised by taxation for such purposes. The trend of authority, in more recent years, has been in the direction of permitting municipalities a wider range in undertakings to promote the public welfare or enjoyment. Thus the appropriation of money for public concerts has been held to be proper. So, too, the erection of an auditorium has been regarded as properly falling within the purposes for which a municipality may provide. Generally speaking, anything calculated to promote the education, the recreation or the pleasure of the public is to be included within the legitimate domain of public purposes, and on this ground it has even been held that authority to erect and conduct an opera house may be conferred upon a municipal corporation.' . . .

"It has been held that sewers, parks, street railway systems, fuel yards, auditoriums, and cemeteries are public utilities, and, following the general trend of later authorities, we are of the opinion that a golf links, while it is a comparatively new form of recreation here, comes within the reasoning of the decisions in the matters above referred to. The intention in the present case is to furnish a means of recreation for the public for which the city is in no wise liable, as it is provided in the contract that the bonds to be issued pursuant thereto shall be paid from the proceeds of fees to be collected from golf players and from no other fund."

Building the Future City

ZONING is a first essential to the securing of a measure of orderliness in the building of a city. The common sense of the average citizen leads to a degree of order in the home, the store and the factory that is all but lacking in the life and work of the community as a whole. For want of a well-considered plan of building development, each man builds without reference to his neighbor. The result is chaotic. Haphazard growth is inefficient, wasteful and ugly. Why not use the same forethought and care in the building of our community home that each man uses in the building of his individual home or factory? Zoning is the direction of building development along orderly and well-considered lines of city growth. On the economic side, zoning means increased industrial efficiency and the prevention of enormous waste. On the human side, zoning means better homes and an increase of health, comfort and happiness for all the people.

—From the Zone Plan for Cranston, R. I., by Robert Whitten, Cleveland.

Daily shifts of 24 hours are not uncommon occurrences for these Autocars, owned by the Borough of Rutherford, N. J.

Zigzagging

another Autocar short wheelbase advantage

BECAUSE the short wheelbase of Autocars enables them to zigzag back and forth across the street, and in this way collect the refuse on both sides of the street, the Borough of Rutherford, N. J., finds them particularly well fitted for the collection of ashes and refuse. They do away with the necessity of working down on one side and then coming back on the other; or of having the men carry the ashes across the street.

The Borough of Rutherford bought their first Autocar eight years ago, and it is still doing its regular turn. They now own four Autocars, three of which are 4-cylinder, 2 to 3 ton models.

Mr. Fred Hackenberg, who is in charge of all the Borough's equipment, uses these Autocars for practically every kind of municipal work—collection of ashes, garbage and refuse; road repairs; street cleaning; and in the winter time, with plow attachment, for snow removal work. It is not unusual for these trucks to be on the job 24 hours a day, working with a snow plow all night, and then going on the regular garbage work in the morning.

Mr. Hackenberg says that Autocar short wheelbase saves trouble on the road to the dumps out on the Jersey meadows, over a particularly bad and narrow road. Out at the end, where there is only a very narrow space for turning around, it is no uncommon thing for longer wheelbase trucks to overrun the bank and wait for one of the Autocars to come along and haul them out.

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Removing the Causes of High Insurance Rates

PRACTICAL efforts to reduce fire losses and insurance rates are already resulting from the new service which the National Fire Protection Association is rendering to municipalities through its recently appointed field secretary, Percy Bugbee. The value of this work is indicated by the following paragraphs from the Concord (N. H.) *Monitor-Patriot* for September 25, 1924, commenting on a report made by Mr. Bugbee to a local fire prevention committee:

Mr. Bugbee gave the committee credit for accomplishing much when it secured the passage of the new building code, which he termed as very good, though he thinks it might be improved in some points. The most obvious deficiency, he said, was the ancient fire-alarm system on which Concord relies. Only yesterday, he said, he found one circuit out of order. The boxes are not numerous enough, he thinks. To forestall argument to the effect that the system has worked, he recalled the fire at Montpelier, Vt., last winter in which seven people lost their lives partly because the alarm did not sound and few firemen responded. Mr. Bugbee praised Chief Green for his watchfulness in keeping the fire-alarm system in the best shape possible and said this vigilance had undoubtedly saved both life and property.

The inspector declared that Concord's record of chimney fires was a disgrace, noting that two-thirds of the fires in 1923 were from this cause. The immediate damage to property was not great, he admitted, but he pointed out that every call cost the city money and left the remainder of the city with less protection. The frequency of these fires he blamed on the citizens, saying that they were caused by hot fires where the chimneys had not been cleaned of inflammable soot for years. He urged a campaign fire prevention week, to the end that all Concord chimneys be cleaned.

The fire department needs more permanent men, the inspector averred. There are at present only sixteen permanent men, hardly enough to furnish drivers for the various pieces of equipment. He also declared that the city needs an aerial ladder for complete protection in the business district, present equipment being insufficient to handle fires properly in some of Concord's business buildings.

Mr. Bugbee had nothing but praise for the work of Inspector Downing, with whom he went through the business district. He said the inspector evidently had the hearty coöperation of landlords, and expressed the hope that Concord might see fit to extend his territory to include the residential sections of the city. He also praised the city collection system as very efficient.

He noted that boiler rooms in down-town blocks were in no case properly protected. They should, he said, have metal sheathing and fire-doors. This condition will be cared for in new construction by the terms of the building code, but the code does not remedy the situation as at present. In fact, it will be years, he said, before the full benefits of the building code will become evident.

Exit conditions Mr. Bugbee found wretched. The matter of exits, he pointed out, was directly concerned with the possibility of loss of life. He cited many instances on Main Street where exits were insufficient and said that fire-escapes were largely a delusion on these buildings because there was no wire-glass protection where they went by windows. He also said that precautions in paint and oil stores were far from up to date.

In conclusion, he said an inspection of the school buildings revealed very good fire protection, a situation he has not found in most cities.

Reciprocity in Fire Fighting Among Small Communities

LARGE fires, even conflagrations, are just as apt to develop in small communities as in larger cities; in fact, the records will probably show that the majority of the serious conflagrations during the past decade have visited towns and cities of modest size.

The reason for this is quite obvious. No city is so small that it hasn't enough buildings to furnish fuel for a conflagration. On the other hand, the average small community is not in a financial position to maintain the reserve of men, apparatus and equipment adequate to combat large fires. A threatening blaze in a large city will bring into play ten trucks and a hundred men. There is perhaps not a single city of the population of 25,000 in the country which has ten trucks and a hundred men in its service. The consequence is that such fires, which are easily controlled in the larger cities, get out of control in the smaller cities and gather the proportions of a conflagration. The further result is (and the statistics will bear us out in this) that the per capita fire loss in the smaller communities of the country is vastly larger than in the larger cities.

Of course, if the smaller communities are to be protected against ungovernable conflagrations, some arrangement must be worked out by which the reserve fire-fighting strength of these small centers of population can be increased without bankrupting the municipal treasuries.

In the more populous sections of the nation, where small cities abound side by side, this reserve can be easily provided through reciprocity. The fire department of each town in the cluster becomes the reserve of the fire departments of the neighboring towns. The principle of reciprocity has not been worked out as completely as it should be. There ought to be specific agreements between groups of communities by which each may feel free to call on the other and each will know for a certainty what it may confidently expect from each other. There ought to be a feeling that the aggregate fire-fighting facilities of the area are pooled and can be quickly diverted to any point of grave danger.

From a report on Organization of the Smaller Fire Department, by a committee of the International Association of Fire Engineers, presented at the 1924 convention, at Buffalo; Chief A. L. Duckett of Asheville, N. C., Chairman.

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Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources
For further information, Mr. Williams may be addressed in care of
The American City Magazine, 443 Fourth Avenue, New York

Recent Zoning Ordinances

Burlingame, Calif.—Ordinance, September 12, 1924
Kansas City, Kans.—Ordinance, August, 1924
New York, N. Y.—Revised resolution, October 3, 1924
Utica, N. Y.—Ordinance, October 1, 1924

The New York City zoning resolution was revised on account of the fact that the zoning maps needed revision to conform to such changes in the street system as have been made subsequent to the adoption of the original resolution in 1916. The amended resolution makes the necessary changes in the maps, modifies certain of the symbols and rules used to fix the character and boundary of specified districts, changes the wording of the resolution itself to conform to the changes in the maps, and strikes out obsolete matter relating to conditions just after the resolution was first passed. Otherwise the resolution is unchanged.

Recent Zoning Decisions

Illinois.—*Superior Court of Cook County.* Two cases involving the validity of provisions of the Evanston zoning ordinance were recently decided, in this court, by Judge Oscar Hebel. They were brought by a property owner by the name of Deynzer. One involved the constitutionality and reasonableness of a residential regulation upon a corner lot in an undeveloped outlying section of the city, while the other involved the reasonableness and constitutionality of a private dwelling restriction prohibiting the erection of an apartment house on Lake Shore property along Sheridan Road.

The Judge sustained the ordinance on the ground that it was not, in any event, clearly in conflict with either the Constitution or the enabling act. The Court stated that he thought the statute a proper exercise of the police power, and that he could not substitute his opinion as to the propriety of placing given property in certain zones, against that of the Zoning Commission, unless the zoning was so unreasonable as to shock the conscience of the Court.

Maryland.—*State ex rel. Mayor and City Council of City of Baltimore v. Rutherford, Court of Appeals, March* 5, 1924. Where a zoning ordinance provided that on appeal from the Board of Zoning Appeals to the City Court the latter should hear the case *de novo*, and contained no prohibition of a jury trial, the granting of a jury trial was not error.

If there are no questions of fact which can properly be submitted to it, nevertheless the presence of the jury could not be harmful, as the Court could direct their verdict.

New Jersey.—*Ingersoll, Relator, v. Village of South Orange; Supreme Court.* In an application for mandamus to show cause why the building inspector should not be required to permit the erection of a three-story apartment for the accommodation of seventeen families in a district zoned against apartment houses, the Court stated that, on these facts alone, the provision forbidding apartment houses was clearly void under the Nutley case. The record, however, contained the following stipulation:

"It is admitted that the authorities would testify that the village has not sufficient fire facilities to adequately take care of apartment houses in the event of fire. It is further admitted, however, that there are at the present time three apartment houses existing in the said village, which were constructed before the so-called zoning law was passed by the State Legislature.

The introduction of this provision, presenting a situation of public necessity upon which it is argued the inherent police power of the municipality for the general welfare may be invoked, as a superadded power to the legislative zoning concession, in the opinion of the Court, injected into the case a new feature which has not been considered by the Appellate Court. For that reason the Court allowed an alternative writ of mandamus, with pleadings so framed as to raise the point in the upper Court.

.... *State ex rel, The Jersey Land Co. v. Scott, Building Inspector of City of East Orange, Supreme Court, May Term,* 1924. Mandamus to compel the issuance of a building permit for the erection of a four-story brick building to be occupied by twenty-four families and a janitor in a district in which under the zoning ordinance the erection of such an apartment house was forbidden. Application to the City Council to change the zone rule affecting the relator, was made and denied. The ordinance provides for a zoning board of appeals with power in a specific case to vary the application of the ordinance in harmony with its general purpose, so that public health, etc., may be secured and substantial justice done. The relator did not apply to the board. *Held,* in accordance with the Nutley case, that the apartment house, being recognized by law as a necessary method of meeting social congestion in cities, and found in large numbers in cities, such a structure should be permitted in the district in question.

New York.—*Application of Berman and Simon for Mandamus against Burden, Building Inspector of City of Mount Vernon; Supreme Court, Westchester County, August* 14, 1924. The zoning ordinance of the city forbids an entrance or exit to a garage for more than five vehicles within fifty feet of a residence "A" or "B" district. *Held,* that the provision of the ordinance is unlawfully and unjustly discriminatory against the garage business, and void; for other forms of business which might be equally annoying to a neighbor in such districts are permitted to have such exits, while garages cannot have them. The

A B-G Snow Loader at work for the Ottawa Electric Railway, Ottawa, Ontario, Canada

$20,000,000— the cost of being snow-bound

During the winter of 1918 a single snow storm cost the down-town merchants of Chicago approximately twenty million dollars. For a week traffic was so handicapped that business fell off to an alarming minimum.

In addition to business losses there are others which concern every resident—traffic tieups, inadequate transportation, lost time and slow deliveries. Often too, heavy snows prevent fire equipment from answering calls promptly, which greatly increases fire dangers.

Many cities are insuring themselves, their transportation, their business and their inhabitants from such extreme losses and dangers by equipping with Barber-Greene Snow-Loaders. They are finding that one Barber-Greene will replace from fifty to two hundred shovelers—that it will work night and day until its job is completed—that it can clear away snow faster and cheaper than any other method.

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The South Park Commissioners of Chicago find that their Barber-Greenes remove snow forty-eight times faster than shovel laborers.

The smaller and medium sized towns as well as the largest cities can afford to use the Barber-Greene to fight snow. When winter dangers have passed the Barber-Greene can be converted into a self-feeding bucket-loader. In this capacity it is an efficient and speedy handler of materials, capable of performing many of the odd jobs that are found in every town.

Our recent booklet, *"Snow Insurance,"* should prove of value to every person who is interested in insuring his town against the extreme losses that snow might cause during the coming winter. It shows how many cities throughout the country, are successfully fighting snow the Barber-Greene way. Send for a copy.

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Coal Loaders . Automatic Ditch Diggers — Snow Loaders . . . . Coal Feeders zoning ordinance as a whole is not condemned, but only the provision in question.

People v. Walsh, Supreme Court, Kings County, reported in New York Law Journal October 11, 1924, *p.* 175. The opinion in part follows:

"The relator seeks to review the decision of the Board of Appeals, which has reversed an order of the Superintendent of Buildings, and permits the owner of land on Bedford Avenue to place a public garage on his property. The plots on both sides of this property are used for business purposes. There is a public garage on the north and a filling station on the south, that being the corner property. The property in question is situated partly in a residence district and partly in a business district, the zoning line passing through about the center of the property; so that we have a situation where there is business on each side of the property, while the property itself is partly in one zone and partly in another. * * * The property thus located between two business properties occupied by buildings of a like character is naturally a business property. It is doubtful in the extreme whether any builder or owner would erect a private residence on property between a garage and an automobile service station. * * * I do not find that there was an arbitrary exercise of authority by the Board of Appeals. The Board in this case acted within their authority, and their determination in view of the existing conditions was proper. The relator urges that the Board of Appeals made a previous decision affecting a part of the premises, which was final. The appeal in this matter came before the Board as a direct appeal, and was not a motion to reopen or rehear a proceeding already determined. There can be no restriction placed on the Board to hear and determine a case on its merits because of another ruling of the Board affecting a part of the premises, raised at another time. The conditions may have been very different at that time. The entire space between the two automobile accessory stations was not under consideration on that appeal. The motion for the writ must be denied."

OHIO.—*Kahn Bros. Co. v. City of Youngstown, Common Pleas Court of Mahoney County, reported in* 25 *Ohio Nisi Prius Reports, New Series, p.* 31; *also in* 22 *Ohio Law Bulletin June* 16, 1924, *No.* 13. This case mentioned in the September "Notes" has been reversed on appeal and is on its way to the highest court of the state.

The Cleveland papers state that suit has been begun in the Federal Court by Charles M. Dennett, to test the validity of the provision of the zoning ordinance forbidding the erection of apartment houses on Edgewater Drive.

PENNSYLVANIA.—*Appeal of Armstrong from Board of Appeals, No.* 1503, *October Term,* 1924. The lot in question is in a district in which the zoning ordinance forbids the erection of a three-family dwelling. On the property immediately adjoining to the north there are two rows of three dwellings each; on the opposite side there are rows of smaller dwellings erected on lots of less area that that of the applicant. The Board, being of opinion that it would be impossible to develop the lot absolutely in conformity with the ordinance and that the properties on the other side of the street, objecting, would be little, if any, affected by the building of a three- rather than a two-family dwelling, allowed the three-family structure as a variance to section 9 of the ordinance on the ground that there were practical difficulties or unnecessary hardships in carrying out the strict letter of the ordinance. The Court therefore dismissed the appeal, stating that the question was not what the Court might have thought proper to do itself if the matter had come originally before it but whether the Board had exceeded its authority in making the variation; and that in the opinion of the Court there had been no abuse of discretion by the Board.

TENNESSEE.—*Arnold Bros. and Stubbe v. City of Memphis and Newton, Building Inspector.* Mandamus to compel the issuance of a permit for the erection of an eight-story office and store building in a "B" residence district, contrary to the zoning ordinance, abandoned on the objection that the building code had not been complied with, in that complete plans and specifications had not been filed; the Court ruling that it was a prerequisite to the issuing of the permit.

City of Memphis v. Williams and Nurham, Police Court, City of Memphis. Three civil suits for penalties for erecting or maintaining an undertaking establishment in a residential district; resulting in judgment for the city for $50 in each case. The cases have been appealed to the Circuit Court.

The Municipal Bond Market

By Sanders Shanks, Jr.

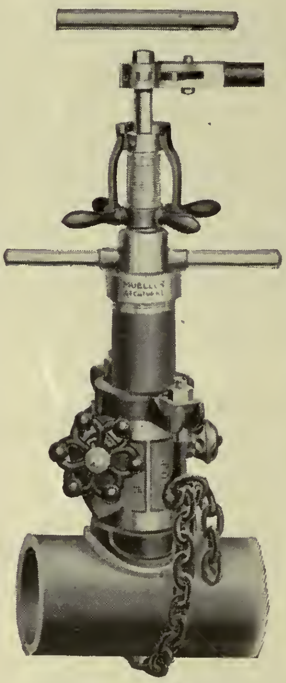
Editor, *The Bond Buyer*

AS is usual at this season of the year, the volume of borrowing by municipalities through the issuance of bonds shows a reduction, as compared with earlier months. In September, bond sales fell off to about $80,000,000, whereas the average monthly output this year has been in excess of $100,000,000. The October total will also be low. The November elections will result in the approval of many new bond propositions, and these will soon be coming on the bond market.

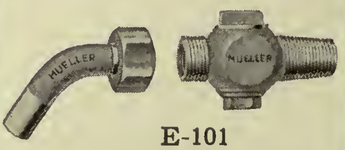
The falling-off in the supply of new bonds has been a favorable factor from the standpoint of the borrower, since it has helped to keep municipal bond prices firm in recent weeks when a tendency toward lower prices has been noted in the case of securities of other classes of borrowers, such as railroad, public utility and foreign governments. Municipals have enjoyed a sharp advance since May 1 of the current year, and the market appears to be firmly established at the high level reached about the middle of September. The outlook for the prospective county, city or village borrower is, at this writing, altogether favorable.

IMPORTANT MUNICIPAL BOND SALES IN SEPTEMBER

Amount	Borrower	Maturity	Coupon Rate (%)	Net Yield (%)
$1,000,000	Tampa, Fla.	1926-74	5	4.59
5,920,000	Saginaw, Mich.	1925-64	4½	4.36
414,000	Cambridge, Mass.	1925-54	4	3.89
5,458,000	Allegheny Co., Pa.	1925-54	4¼	4.04
1,300,000	Durham, N. C.	1925-39	4½	4.49
665,000	Plainfield, N. J.	1925-62	4½	4.25
485,000	Mobile, Ala.	1954	5	4.73
1,500,000	Portland, Ore.	1935-54	4	4.35
2.140,000	Boston, Mass.	1925-69	4	3.97
2,000,000	Providence, R. I.	1954-64	4	4.03
1,515,000	Roanoke, Va.	1926-54	4½	4.43



"B" Tapping Machine



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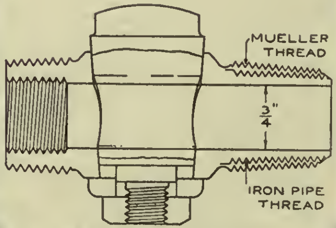

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From the International Union of Cities

Items translated from "Tablettes Documentaires Municipales' by Stephen Child, 538 Merchants Exchange Building, San Francisco, Calif., to whom requests for further information regarding this source of civic documentation should be addressed

Ideas Gleaned from the Proceedings of the Recent International Congress on City Planning, in Amsterdam

Regional Planning 71.2

In a paper delivered at the Amsterdam Conference, Raymond Unwin, the well-known English town planning expert, urges the necessity for regional planning. He discusses the modern town in very concrete terms. He asserts that the original Garden City movement is changing into a more general movement for the better development of all cities, which cannot succeed without a corresponding development of the entire region surrounding the city. He considers the problem of the concentration of population in cities and its resultant serious inconvenience; conditions which must be offset in order that the city, the crown of all civilization, may be able to raise the great mass of citizens rather than debase them.

New centers of life in the form of satellite cities—industrial or residential suburbs—must be created. With wireless telegraph and wireless telephone assured, with tele-vision soon to be realized; with the development of better means of transportation, everything favors the formation, at a distance from great centers, of smaller centers, dowered with autonomous individual life and with a high degree of culture for their citizens.

Regional Planning 71.2

Professor Abercrombie of the Department of Civic Design of the University of Liverpool also discusses regional planning. As a basis for this, he recommends a regional survey, a systematic collection of facts and data under ten different headings: (a) The Physical Condition of the Region; (b) Its Historical Development; (c) Economic Conditions; (d) Data in Regard to Population and Housing; (e) Public Health Conditions; (f) Traffic, Circulation; (g) Open Spaces, Forests, etc.; (h) Culture and Education; (i) Public Services or Utilities; (j) The Utilization of the Soil or Natural Zoning.

Professor Abercrombie gives a resumé of the facts assembled by ten regional planning surveys recently made in England and calls attention to the value of their publication.

Regional Planning in the Ruhr District of Germany 71.2 (43)

Engineer R. Schmidt is the director of an organization formed for the coordination and better development of the Ruhr District in Germany. He reported at the Amsterdam Congress some results of this important movement. The District has an area of about 1,500 square miles and includes 300 different communities. There are three divisions in the organization: a General Assembly, elected by the people of the entire District; an Executive Committee, chosen from the Assembly; and a Director or Manager.

Director Schmidt explains in detail the composition and functions of the first two and the powers of each of the three, as regards (1) ways of communication, (2) means of transportation, (3) laying out and widening of streets and ways, (4) loans and other means of raising funds, (5) zoning, (6) forest reserves, (7) the distribution and decentralizing of population. Director Schmidt recommends the passage of a law making obligatory the exchange of land for rectifying and improving the limits of communities, maintaining that without such a law the regional plan cannot be executed. He suggests also a general law in regard to the regional planning of industrial districts that would regulate the authority of regional plans; authorize plans for extension of the separate communities of such districts; and provide for the rectification or adjustment of the boundaries of private property affected by such plans. He also suggests a revised general building law; and intercommunal regulations or laws.

Regional Planning in Holland 71.2 (492)

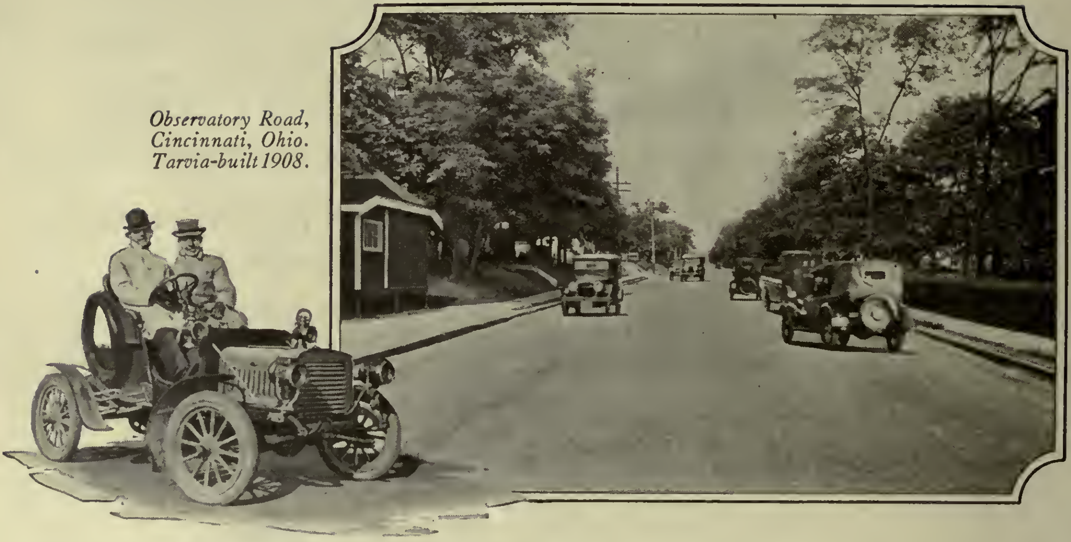
C. A. Van Poelje at the Amsterdam Congress proposed a scheme for the regional planning of all Holland. He suggests: (a) the passage of a special independent law in regard to housing for the entire nation; (b) the creation of regional committees or commissions whose composition and powers he defines; (c) the creation of a general commission for the entire country.

Satellite Cities 71.327.3

C. B. Purdon discusses satellite cities in their relation to regional planning. These he would have Garden Cities, each complete in itself but dependent, however, to a certain extent upon one another and coordinated with the metropolis they surround. He would limit their population to 30,000, 50,000 or, at the most, 100,000 inhabitants. He would have them separated from one another and from the metropolis by 6 to 15 miles. He believes it best to create them anew rather than to transform existing villages. The space between should be reserved for agriculture, forests or the like and be maintained permanently unbuilt upon. He exhibited a plan for a scheme for the distribution of some thirty satellite cities around London, to correspond to those at Letchworth and Welwyn. Several regional plans now going forward in England have for a basis the creation of satellite cities. He believes that the idea is adaptable to many other countries.

Open Spaces 71.6

Professor Schumacher discusses the beauties and advantages of natural open spaces in connection with regional planning. Any plan for the extension of a city should include not only the portions that will be built upon but those that should be held open and unbuilt upon—particularly areas that are well dowered with natural beauty,



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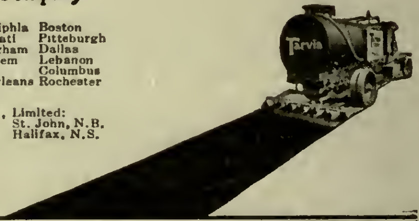

such as ravines or steep cliffs. Such open spaces, however, are not enough. It is necessary to plan for a continuous, verdurous park system. Instead of the system of extension of towns by means of successive rings or belts, he prefers the radial arrangement, separated by unbuilt-upon areas penetrating toward the heart of the city, in which will be found playgrounds and land set aside for agriculture and gardening. He hopes that very soon there will be enacted in Germany and elsewhere laws permitting the permanent maintenance of agricultural ground—that is to say, preventing the occupation of such ground by building. He believes that the passage of such laws is urgent in order that the open spaces between towns now reaching out toward one another or between metropolitan centers and future satellite towns may be preserved.

Hints, Helps and Happenings

More Money for Recreation Means Less Money Needed for Reform Schools

WHEN the effectual remedy can accompany the diagnosis of a disease, there is particular satisfaction in knowing how bad things are and in applying the cure at once. It looks as if juvenile delinquency is on the increase in ten widely separated cities and nine counties, which have been studied by Robert K. Hanson, director of boys' work for the Rotary Club of Newark. Mr. Hanson's statistics are given in the accompanying table, and the remedy which he recommends is included in the following paragraphs from his report:

"When eight out of nine counties in America show an increase in crime, it is high time that the people of our country become more interested in the citizens of to-morrow. In the city of Newark there will be a definite program of spare-time activities in wards which show crime increases, and it is hoped that all boys' work agencies in Newark will participate in this move, which is being inaugurated by the Boys' Work Committee of the Newark Rotary Club.

"Judge Brennan of the Essex County Juvenile Court and his entire staff are working to interest the parents of the wayward boys to realize their responsibilities, and by so doing the Court is assuming a role which other courts might well follow. Buffalo and Seattle are working along similar lines, and their reports prove that it is the wise thing to do.

"It is in hours of leisure misspent that crime and delinquency flourish. Playgrounds and recreation centers are preventives of delinquency and are training schools for citizenship. Experience in many cities has shown that in the neighborhood of playgrounds juvenile delinquency has decreased from 18 to 50 per cent.

"Cities have come to realize that money spent on recreation means reduced expenditures for reform schools and correctional institutions; that recreation makes for health and good citizenship; that a year-round recreation system makes a community interesting to its citizens and attracts outsiders. It makes a town a good place in which to live."

CITY—COUNTY	Latest Federal Census Figures	Age Limit	Predominating Nationality of Offenders	Most Offenses at Age of	Majority of Offenses	Total Cases of Juvenile Delinquency			
						1920	1921	1922	1923
Buffalo— City Only	545,273	16	Polish	15	Larceny	1041	1021	676	942
Cincinnati— Hamilton County	508,947	18	American	15	Petty Larceny	983	1072	1169	1480
Indianapolis— Marion County	387,180	16	American born	15	Larceny	459	383	351	537
Pittsburgh— Allegheny County	1,263,376	16	Polish	14	Larceny	890	1061	763	875
Providence— Providence County	498,754	16	Italian-American	13	Larceny	628	613	487	563
San Francisco— San Francisco County	54[illegible],284	20	American	17	Larceny	656	665	696	614
Seattle— King County	437,772	18	No statistics	15	Dishonesty	841	765	913	957
Worcester— Worcester County	480,849	17	Polish	14	Larceny	544	435	459	485
Detroit— Wayne County	1,477,103	16	Polish-American	15	Larceny	1,539	1,312	1,539	1,763
Newark— Essex County	716,612	16	Italian-American	15	Larceny	1,052	1,016	959	1,224
						8,624	8,343	8,012	9,404

The Wisconsin Better Cities Contest

TWENTY cities in Wisconsin are contesting in the Wisconsin Better Cities Contest, under the auspices of the Wisconsin Conference of Social Work, for the honor of being the best place in the state in which to rear children. The contest opened last June and will close in June, 1925.

The contesting cities will be judged on ten measurement units, corresponding to ten divisions of community activities, which, if rightly carried on, will secure wholesome, progressive, individual and community life: (1) Education; (2) Health and Physical Development; (3) Recreation; (4) Library; (5) Town and Rural Relations; (6) Social Welfare; (7) City Beautiful; (8) Indus-

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try; (9) Public Administration; (10) Religion.

Two groups of cities are contesting: those of 10,000 to 60,000 population, for a prize of $1,000; and those of 3,000 to 10,000 population, for a prize of $500. Two sets of units of measurements are filled out by local joint city committees. The first is purely fact-finding for local information, to provide a basis of immediate intelligent improvement. The second presentation of facts, based on the ten scoring schedules, will constitute the basis of award. Five judges are to make the awards, and in addition to studying the filled-out schedules, they will make personal visits to every city entered in the contest.

Copies of the general plan and the individual scoring schedules may be secured by request to Aubrey Williams, Executive Secretary, Wisconsin Conference of Social Work, University Extension Building, University of Wisconsin, Madison, Wis.

More Than 22,000 Deaths on the Highways Last Year

THE Department of Commerce announces that estimates indicate that during the year 1923 highway fatalities in the United States totaled 22,621, or an increase of 3,418 over the previous year. The 1923 death-rate from these highway accidents was 20.4 per 100,000 population, as contrasted with 17.6 in 1922. This increase was largely due to the increase of 2,776 deaths in the estimated number of fatalities from automobile accidents. Even the 16,452 deaths charged against the automobile do not tell the whole story, as deaths resulting from collisions between automobiles and railroad trains and between automobiles and street cars are charged to the heavier vehicle. Two thousand fatalities from such collisions in 1923 is a conservative estimate for the United States. If this figure and the fatalities from motor-cycle accidents be added to the figure for automobile accidents, the final 1923 toll from motor machines on highways becomes 18,788, or 83 per cent of all highway fatalities:

HIGHWAY FATALITIES IN THE UNITED STATES

	Estimated Fatalities 1923	1922
Total	22,621	19,203
Train grade crossing accidents*	2,268	1,810
Street car accidents	2,006	1,748
Automobile accidents	16,452	13,676
Motor-cycle accidents	336	314
Injuries by other vehicles	1,559	1,655

*Grade crossing figures from Interstate Commerce Commission.

League of Neighbors to Hold Festival

AN International Neighbors Festival, to be held at the Elizabeth, N. J., Armory from November 13 to 15, inclusive, is being organized by the League of Neighbors. Plans for the festival as so far outlined include a pageant parade, in which racial or national groups, city, county and state departments, educational, civic, commercial, social, religious, and other groups are invited to take part. Dramas, played by trained actors, will help to portray the life, customs, and ideals of the people of foreign lands. One afternoon's program will be devoted to a study of child life, reviewing the games, stories, studies and duties of the boys and girls of many climes. In decorated booths exhibits of pictures, tableaux, arts and crafts, etc., will visualize many phases of life in other countries. On the afternoon of Sunday, November 16, the League will conduct a Fellowship of Faiths.

Further particulars may be secured by addressing the League of Neighbors, 200 Broad Street, Elizabeth, N. J.

National Fire Waste Council Creates Field Service Committee

THE National Fire Waste Council has created a Committee on Field Service, to assist local chambers of commerce in making their fire protection activities effective. Field Secretary Bugbee will serve the fire prevention committees of the local chambers where desired, under direction of the Field Service Committee in cooperation with the regional secretaries of the Chamber of Commerce of the United States.

Changing the Use of Public Property

To the Editor of THE AMERICAN CITY:

Both the necessity for sometimes "Changing the Use of Public Property" and the difficulties attendant upon it, are ably described by Mr. Street in your September issue. Where permanent funds have been left for specific purposes, it frequently happens that those purposes become antiquated. Even in jurisdictions where the *cy-pres* doctrine prevails or where statutes provide a method of revising the uses served by these moribund funds, the process is prolonged, expensive, and productive of endless litigation.

A remedy has been devised, and adopted in some fifty cities—the community trust. It provides for the setting up of trust funds or endowments for whatever purposes the donor specifies, with the further provision that a board of citizens—usually constituted by such sources of appointment as the Federal courts, the probate court, the mayor, the trustees of the funds, etc.—shall be empowered to make such readjustments in the employment of income from the trust fund as may be required, if it should become impossible or impractical in the future to carry out the purposes originally named.

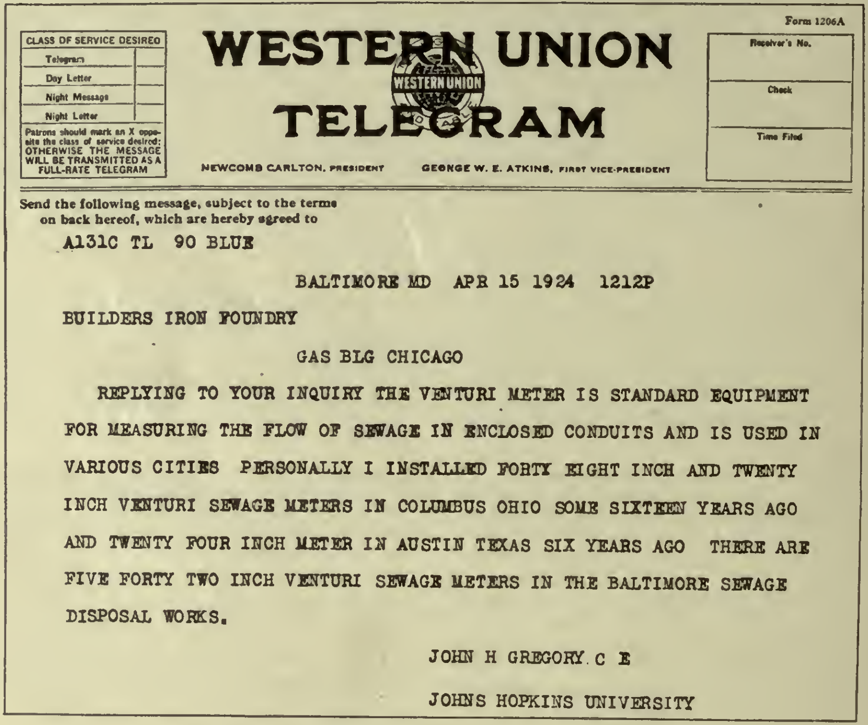
This committee, usually called the Distribution Committee, is made up differently in various cities. In New York it consists of eleven members, five appointed by the trustees of the New York Community Trust and the remaining six named by the senior judge of the United States Circuit Court of Appeals, the President of the Academy of Medicine, the President of the Chamber of Commerce, the Mayor of New York, the President of the Brooklyn Institute of Arts and Sciences, and the President of the Bar Association. The Committee supervises annually the use of income from trust funds, but it has no occasion to amend the terms of the grant unless and until the further expenditure of income in the ways originally enumerated becomes clearly unwise.

The Community Trust plan has been warmly endorsed by such lawyers as Roscoe Pound, Morgan J. O'Brien, and George Gordon Battle; by such educators as Charles W. Eliot, F. P. Keppel and E. R. A. Seligman; and by such economists as Irving Fisher, Leonard P. Ayres, and Roger W. Babson.

RALPH HAYES,
Director, New York Community Trust.

New York, September 30, 1924.

A Telegram on the Measurement of Sewage



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The Library and the Community.—By Joseph L. Wheeler, Librarian, Youngstown Public Library. American Library Association, Chicago, Ill. 1924. 417 pp. Illustrated. $2.85.

Why it is essential for the librarian to know the history, geography, government, standards, tendencies, vocations, physical and social facilities and influences of the community in order that the library may give the highest service, is explained and emphasized in this authoritative volume. How public opinion may be won to the support and use of the library is fully dealt with. The section on The Technique of Publicity is exceedingly valuable, giving a wealth of detailed information regarding the preparation and display of publicity material, the conduct of pageants, memorials and campaigns, and suitable and effectual spoken publicity. There is also important information on help for children and schools, the foreign-born, and industrial workers, with instructive material regarding the work of branches and stations, and village and county libraries.

Tree Habits—How to Know the Hardwoods.—By Joseph S. Illick. Published by American Nature Association, Washington, D. C. IV + 316 pp. Illustrated. $4.00.

There is a friendly spirit about this book—friendly to nature and to those who appreciate nature—that makes it very delightful to read and study. Its deep purpose is to emphasize the need of forest preservation, and to that end to make the public like and understand trees. More than one hundred native American and adopted hardwood trees are described and compared with fifty or more others. Individual groups are characterized in tables as to their leaves, bark, buds, fruit and general habits. The photographs and drawings are beautiful and illuminating. The final chapter is a Guide to American Hardwood Trees, in which an interesting classification is used: Trees That Bear Pods; Trees That Have Spines or Thorns; Trees With Stout Branches, etc.

Social Welfare Administration.—Published bi-monthly by "Better Times," 100 Gold Street, New York, N. Y. $1.00 a year.

This handy-size magazine is the successor of the section of "Better Times" (the organ of New York charitable and social work), that was known as "Money Raising and Administrative Methods." It is intended for executives and directors of charitable organizations, welfare institutions, and other social agencies throughout the United States and Canada. It deals with such subjects as office management, record keeping, publicity, money raising, purchasing, printed matter, accounting, and committee organization. The October issue has 32 pages. George J. Hecht is Editor, and Gertrude Springer, Managing Editor. A free sample copy will be sent on request to any one interested.

Constitutionality of Zoning in the Light of Recent Court Decisions.—By Edward M. Bassett, Counsel of Zoning Committee of New York; Director of Legal Division of Regional Plan of New York and Its Environs. 6 pp. Reprinted from National Municipal Review for September, 1924. "The law is clear as to height, area and bulk. . . The subject of use is to-day the only battlefield in the courts. . . Zoning is doing its proper task and the courts are helping it along, but it cannot be stretched to cover the entire field of private restrictions, or to carry out all the ideals proper and improper of exclusive residential communities." (Apply to National Municipal League, 261 Broadway, New York, N. Y.)

School Progress in a Modern City.—What Public Schools Do and Might Do. Report of a cooperative self-survey of the schools of Mount Vernon, N. Y., made as the result of a request of the Mount Vernon Chamber of Commerce and directed by The Institute for Public Service, New York City. Published by the Board of Education. 243 pp. Illustrated. Also a Survey of Mount Vernon's School Building Program, 1922—a report by The Institute for Public Service, April 10, 1922, to the Mount Vernon Department of Public Instruction; 14 pp. Definite questions were asked by the Board, to which the Institute has given definite answers in these reports, covering the business and educational efficiency of the schools. Very detailed information is given on the work and conditions of the schools and on the results in the community. (Apply to the Board of Education.)

Principles of Real Estate Appraising.—By Charles C. Knox, Vice-President and Appraiser, The Home Savings and Loan Company, Youngstown, Ohio. Issued by Robert C. Knox, 445 Catalina Avenue, Youngstown, Ohio. 1924. 75 pp. Tables. $10.00 postpaid.

The methods explained in this volume are based on the author's experience of nearly thirty years. They are explained in careful detail with reference to all kinds of land and building property. A number of tables are given to aid in computations. These tables include many giving the cubic feet of buildings from 4 to 52 feet wide, with various lengths and heights.

Publicity for Public Libraries.—By Gilbert O. Ward, Technical Librarian, Cleveland Public Library. The H. W. Wilson Company, New York. 1924. VII + 315 pp. Illustrated. $2.40 postpaid.

Principles and methods for librarians, library assistants, trustees, and library schools, rather than samples of ready-made publicity. A practical text-book for the less-experienced library worker, showing how to analyze the public which the library is to serve, how to find out whether the library is fitted to serve this particular public, what the library message is and how to present it, and giving many details as to the mechanism of the work. An interesting and valuable book, containing much information helpful to any one who is trying to use intelligent publicity for a good cause.

Periodicals for the Small Library.—By Frank K. Walter, Librarian, University of Minnesota. American Library Association, Chicago, Ill. 1924. Fourth edition, rewritten and enlarged. 89 pp. Cloth, 75 cents; paper, 50 cents.

This little volume voices an understanding of the fact that many readers are appealed to primarily by periodicals rather than books, and that libraries should meet this tendency intelligently. The placing of subscriptions for periodicals, and how to circulate and bind the magazines, are carefully explained. A selected list of periodicals is given, with discriminating characterizations which enable the librarian to choose wisely for the local public. First-choice lists are given for special uses. Agricultural, educational, technical, and library periodicals are dealt with in separate classifications, and there is special information on periodical indexes and the use of newspapers in the library.

Municipal Accounting.—By E. F. MacDonald, Chief, Division of Accounting, Pennsylvania Bureau of Municipalities. Published by the Bennett Accountancy Institute, Broad and Spring Garden Sts., Philadelphia, Pa. 59 pp. The material in this pamphlet is given under three divisions: Municipal Government; Financing the Municipality; The Accounting Records. The form of presentation is brief, definite, and clearly outlined. Many illustrative accounting forms are given. A glossary of accounting terms is included, and review and examination questions furnish a good test for students of the course. $3.00. To business schools and colleges, $1.00 per copy in stock orders of 30 and over. (Apply to the publishers.)

Bond Issues in Memphis, Tenn.—A chapter from the final report of the City Planning Commission, by C. C. Pashby, City Clerk. 7 pp. "It appears that Memphis is well within conservative limits and can afford a further expansion of well-chosen permanent improvements to be undertaken at the rate of about $1,000,000 per year, in addition to self-supporting enterprises and also in addition to special assessment work. This can be done without increasing the per capita debt and without increasing the ratio of debt to assessed values." (Apply to the author.)

Housing in Philadelphia.—By Bernard J. Newman, Managing Director, Philadelphia Housing Association, 311 South Juniper Street, Philadelphia, Pa. 50 pp. Illustrated. The most up-to-date publication issued in that city dealing with the housing situation. It answers the question, Has the housing shortage in Philadelphia been reduced? and discusses the problems of insanitation, the progress of housing legislation in the state and the city, and gives an account of the public education and consulting service rendered by the Association. Part III gives reports of special surveys on water waste, tenements, negro migration and congestion, demolition of buildings, rental conditions and rates, and housing construction. (Apply to the Association.)

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Smoke Abatement.—A study of the police power as embodied in laws, ordinances and court decisions. By Lucius H. Cannon, Librarian, Municipal Reference Library, St. Louis, Mo. August-September, 1924. 320 pp. Illustrated. A presentation of the legal history of smoke abatement in many American cities and in some foreign cities, with the laws of certain states, Canada, England and Germany, a bibliography, and a list of cases on smoke and some other nuisances. 50 cents. (Apply to the Municipal Reference Library. City Hall, St. Louis, Mo.)

National Health Series.—Last six volumes of the twenty-volume series. Pocket size, with flexible covers. Exercises for Health, by Lenna L. Meanes, M. D., Medical Director, Women's Foundation for Health, Inc., 71 pp.; Health of the Worker—How to Safeguard It, by Lee H. Frankel, Ph. D., Chairman, National Health Council, 78 pp.; The Child in School—Care of Its Health, by Thomas D. Wood, M. D., Professor of Physical Education, Columbia University, 77 pp.; Adolescence—Educational Hygienic Problems, by Maurice A. Bigelow, Ph. D., Professor of Biology, Teachers College, Columbia University, 60 pp.; Home Care of the Sick—When Mother Does the Nursing, by Clara D. Noyes, R. N., Director, Nursing Service, American Red Cross, 70 pp.; Your Mind and You—Mental Health, by George K. Pratt, M. D., Medical Director, Massachusetts Society for Mental Hygiene. 1924. 30 cents each. (Apply to Funk & Wagnalls Company, New York, N. Y.)

Public Dance Halls, San Francisco.—Report of the Public Dance Hall Committee of the San Francisco Center of the California Civic League of Women Voters. By Maria Lambin (Mrs. James Rorty). 1924. 25 pp. 25 cents. (Apply to the San Francisco Center of the League, at Hotel St. Francis, San Francisco, Calif.)

Indiana Taxpayers Calendar and Guide.—A 12-page handy-size pamphlet issued by the Indiana Taxpayers Association, 314 Hume-Mansur Building, Indianapolis, Ind. Giving information as to the time and conditions of tax assessments, payments, and penalties, and the taxpayers' rights under the law, together with the time within which such rights may be exercised. (Apply to the Association.)

Group Service in the St. Louis Public Library.—By Arthur E. Bostwick. 1924. A study of the librarian's problem in bringing books and readers together by appealing to the latter in local groups—religious, hereditary, linguistic, educational, age, sex, social, fraternal, vocational, political, recreational, etc.; and showing how the St. Louis Public Library (of which the author is the Librarian) is carrying on this work. 37 pp. Illustrated. (Apply to the author.)

Rates for Natural Gas.—Report on Proposed Rates for Natural Gas in the City of Cincinnati, Ohio. Quarto mimeographed pages with many tables. (Apply to the consulting engineers, the Technical Advisory Corporation, 15 Park Row, New York, N. Y.)

General Ordinances of the West Chicago Park Commissioners.—Adopted January 12, 1924. Compiled and codified under the supervision of Edwin T. Farrar, then President, West Chicago Park Commissioners. 72 pp. (Apply to Dr. John Dill Robertson, President, Board of West Chicago Park Commissioners, Union Park, Chicago, Ill.)

Amsterdam—Development of the Town Housing Improvement.—A very attractive booklet of 94 pp. with many illustrations—reproductions of ancient maps and drawings of portions of the city, and views and plans of the city's modern development. Half of the publication is devoted to the housing improvement in all its phases—legal, financial, social, and constructional. Published July, 1924. (For sale by the Town Printing Office, Amsterdam, Holland.)

Town Planning Institute Exhibition.—Proceedings of Conference and Record of Town Planning Exhibition held at the British Empire Exhibition, Wembley, April 23-May 17, 1924. The Conference was attended by some 300 delegates from local authorities, members, and visitors from the Dominions. It is reported in 77 quarto pp., which are followed by 15 pp. descriptive of the Town Planning Exhibition. A number of important papers by town planning authorities are given. 5 shillings. (Apply to the Town Planning Institute, 11, Arundel Street, Strand, London, W. C. 2. England.)

Foster-Home Care for Dependent Children.—Eleven articles by representative people who are at work on the particular aspects of the problem which they discuss. A very full discussion. Publication No. 136 of the Children's Bureau of the U. S. Department of Labor, Washington, D. C. 1924. X + 275 pp. including five appendices containing bibliographical and conference material on the subject. 30 cents. (Apply to the Government Printing Office, Washington, D. C.)

The Public Library Building Plan.—By John Adams Lowe, Assistant Librarian, Brooklyn Public Library. Reprinted from The Architectural Forum of January and February, 1924. Published by the American Library Association, Chicago, Ill. 1924. 14 quarto pp. Views, plans. A most interesting presentation of an analysis of the public's needs in a library building and how to plan the building so that the library will be used to the best purpose. "It is not enough that a building serves. It must inspire." (Apply to the publishers.)

A Study of Public School Costs in Illinois Cities.—A report reviewed and presented by the Educational Finance Inquiry Commission under the auspices of the American Council on Education, Washington, D. C. The report was prepared for the Commission by Nelson B. Henry of the staff for Illinois. Published by The Macmillan Company, New York. 1924. XI + 82 pp. Diagrams, tables. $1.00. An intensive study of the current costs in twelve typical cities, on which is based an estimate of the final operating cost of the present public school programs in Illinois cities of at least 10,000 population, exclusive of Chicago. Also developing a method of analysis, and throwing some light on the problems of financing public school enterprises. (Apply to the publishers.)

Community Forces.—A study of the Non-Partisan Municipal Elections in Seattle. By R. D. McKenzie. Reprinted from The Journal of Social Forces, January, March, May, 1924. 24 quarto pp. Maps, tables. An analysis of the forces which have been brought into relief by the non-partisan system of election, based on data taken from city reports and documents for the last thirteen general elections, and from newspapers and the official reports of various organizations that have participated in the elections. 30 cents. (Apply to Howard W. Odum, Managing Editor, The Journal of Social Forces, University of North Carolina, Chapel Hill, N. C.)

A Census Analysis of Middle Atlantic Villages.—A study of the 1920 Census data for 34 villages in New York, Pennsylvania and Maryland, by C. Luther Fry. Published by the Institute of Social and Religious Research, 370 Seventh Avenue, New York, N. Y., which cooperated with the Federal Census Bureau and the U. S. Department of Agriculture in a special tabulation of data of 150 representative villages throughout the country. 36 pp. Diagrams, tables. The first detailed analysis ever made of the composition, characteristics, and occupation of village populations. 35 cents. (Apply to the Institute.)

Municipal Opera Achievement at St. Louis.—By John B. Archer, in the Providence Magazine of September, 1924, published by the Providence Chamber of Commerce, Providence, R. I. 6 pp. Illustrated. A very entertaining account of St. Louis' successful undertaking, with many details—social, cultural and financial. (Apply to the publishers.)

St. Louis Facts.—Volume One, Number Two, September-October, 1924. 16 quarto pp. Illustrated. Published bi-monthly to acquaint St. Louis citizens with the accomplishments of their municipal government and for the recording of facts and happenings, with particular reference to health and welfare. Distributed without charge to the citizens of St. Louis. Subscription by mail, 50 cents. This number contains articles on the Rocky Branch relief sewers, the St. Louis water-works, and the new monkey house for the Zoo, besides other interesting material. (Apply to the publication, at 329 Municipal Courts Building, St. Louis, Mo.)

Police Commissioner Enright's Proposed Civic Center.—Reprinted from The New York Times of May 25, 1924. A article by Richard E. Enright, Police Commissioner of New York City, under the heading "Enright Proposes Civic Center for City—He would Use Twelve Blocks Above North End of Central Park—Project for a Great Municipal Site Is Linked with Plan to Relieve Traffic Congestion in Lower Manhattan." Including comment on the article. 15 pp. with enclosed map of plan. (Apply to the Commissioner.)

Southern Pine Homes.—Published by Southern Pine Association, New Orleans, La. 1924. 60 pp. Views and plans for fifty houses, principally suited to southern climatic conditions, but adaptable to other sections. The blue-prints and general specifications of these houses are usually obtainable through retail lumber dealers, but in any case from the publishers, at $1.50 a set. Apply to the Southern Pine Association.

Two Water Pageants.—A Fairy Water Play without Words, and The Giant's Garden. By Lucy South Proudfoot. Plays for swimming classes in association, camp or school, affording opportunities for exhibitions of dancing and swimming activities. Published under one cover. 15 mimeographed typewritten pp. 50 cents. Published by The Woman's Press, 600 Lexington Avenue, New York, N. Y. (Apply to publishers.)

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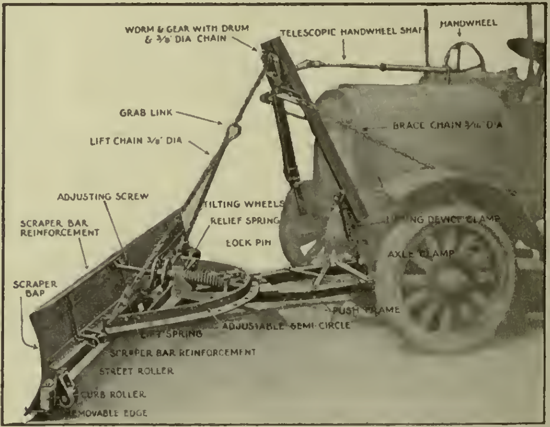

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The Good Citizen.—By Walter R. Hepner, Assistant Superintendent of Fresno City Schools, Fresno, Calif., and Francis K. Hepner formerly of the Harrison Technical High School, Chicago, Ill. Houghton Mifflin Company, Boston. 1924. X + 435 + XXVII pp. Illustrated. $1.40.

A text-book in social and vocational civics, for high school boys and girls. The students are led from an understanding of the neighborhood group to which each belongs, to a comprehension of industrial and political groups, their organization and functions. The essentiality of cooperation is thus emphasized, and also the importance of adaptation and development in all our institutions to meet changing needs. The pupil is taught to think for himself, and to participate in community interests, and to this end each chapter opens with a list of "problems for you to investigate," and each subdivision of a chapter closes with suggestions and problems for discussion.

The Constitution of Our Country.—By Frank A. Rexford, Supervising Civics in the High Schools of New York City, and Clara L. Carson, Chairman of the Civics Department of Wadleigh High School, New York City. American Book Company, New York. 1924. XX + 186 pp. Illustrated. 76 cents.

Many states require the teaching of the Constitution in the public schools. This book meets such requirements by presenting the Constitution in terms of everyday life. It is both a handbook and a text-book for young pupils, emphasizing the relation of the young citizen with his country by explaining his duties and his rights under the Constitution. It makes clear the history of the Constitution and its principles, with the activities which it authorizes.

Major Streets, Present and Proposed, South Bend, Ind.—Prepared by Harland Bartholomew, City Plan Engineer, for the City Plan Commission, and submitted by the Commission to Mayor Eli F. Seebirt, February 15, 1924. 47 quarto pp. Views, maps, drawings, besides inserted maps. The Commission says: "During the past year over a thousand acres of land was subdivided. These plats were made to conform to the Major Street Plan. The value and practicability of the plan has been proven beyond doubt. The streets in these subdivisions will conform with the existing streets and will be of sufficient width to carry the traffic of the future." The Appendix gives the City Planning Law of Indiana. (Apply to Fred J. Anderson, City Engineer.)

Manual of Smoke and Boiler Ordinances and Requirements.—Official publication of the Smoke Prevention Association. 1924. 116 pp. Illustrated. Containing the ordinances and requirements for smoke prevention in 41 cities, and the proceedings of the 1924 convention of the Association, with a suggested smoke abatement ordinance, and lists of railroad and city officials in charge of smoke abatement. (Apply to Columbus D. Behan, Publicity Director of the Association, Room 1411, City Hall Square, Chicago, Ill.)

School of Citizenship, Syracuse University.—The August Bulletin of Syracuse University announces the opening, in September, of the School of Citizenship and Public Affairs at the University. An outline of the four years' course is given and a statement of the provision for post-graduate study. Dr. William E. Mosher, of the National Institute of Public Administration, is Managing Director of the School. For further information address the School of Citizenship and Public Affairs, Syracuse University, Syracuse, N. Y.)

Official Camping and Camp Site Manual.—Edition for 1924-1925, published by the American Automobile Association; National Headquarters, 1108 Sixteenth Street, N. W., Washington, D. C. (New York Touring Bureau, 501 Fifth Avenue, New York, N. Y.) Handy size. 118 pp. Illustrated. The information is given under two general heads—Fundamentals of Motor Camping, and Automobile Camp Sites. Equipment for the car and for the camp, what to wear and to take for personal use, how to select, conduct and break camp, are all outlined, with many useful hints. Part 2 lists and characterizes automobile camp sites throughout .the country. 50 cents. (Apply to the publishers.)

Municipal Finance in Rochester, N. Y.—Report of a Study of the Financial Condition and Practices of the City of Rochester, N. Y. Issued by the Rochester Bureau of Municipal Research, Inc., December, 1923. 73 pp. besides many tables. Containing: first, a general description of the financial procedure; second, a history of financial transactions for the past thirteen years; third, an analysis of the financial condition of the city at the present time; and fourth, suggestions for remedying or relieving the situation. (Apply to the Bureau.)

City Plan for Springfield, Mass.—By the Planning Board. Technical Advisory Corporation, consulting engineers, Frederick Law Olmsted, special adviser. 212 quarto pp. besides enclosed maps. Views, maps, charts, tables. The history of city planning in Springfield is given, and the needs of the future are presented with analyses of the ways in which these can be met. Views from other cities are given, showing how similar problems have been solved. The detailed study is made under the following divisions: Building Zones (municipal control of the use of private property); Railroads; Thoroughfares and Parkways; Transit, Street Cars and Busses; Down-town Traffic; Water-Front Development; Parks and Reservations; Playgrounds and Recreation; Distribution of Schools and Other Public Buildings; Civic Center; Civic, Educational and Art Center; Tax Equalization. (Apply to the Technical Advisory Corporation, 15 Park Row, New York, N. Y.)

Ontario Hydro-Electric Power Commission, Ontario.—Sixteenth Annual Report, for the year ending October 31, 1923. XIV + 619 pp. Views, maps, diagrams, tables. Covering all phases of the operations of the Commission with respect to 13 systems to which are connected 356 municipalities, and including financial statements of the municipal electric utilities operating in conjunction with the various systems of the Commission and supplying electrical service to the people of the Province. (Apply to W. W. Pope, Secretary of the Commission, Toronto, Ont.)

Colorado Municipal League.—Proceedings of the Second Annual Conference of the League, held at Pueblo, March 25-27, 1924. 86 pp. Containing a number of papers on various phases of municipal and civic affairs. Compiled by Don C. Sowers, Secretary-Treasurer of the League, Boulder, Colo., to whom apply.

Traffic Control and Safety.—A review of existing methods and devices for promoting highway safety. By E. W. James, Chief, Division of Design, U. S. Bureau of Public Roads. 15 pp. in the August, 1924, issue of Public Roads. Many illustrations. Showing what progress has been made in securing the independent safety of the individual driver, the common safety of passing drivers, the safety of pedestrians, and the economic maintenance, care and preservation of the road. (Apply to the U. S. Bureau of Public Roads, Washington, D. C.)

International Town Planning Conference, Amsterday, 1924.—Sixteen papers from the Conference, each given in the language in which it was delivered, with a summary in French, German, English, and Dutch, 286 pp. Illustrated. Many phases of city and regional planning are covered. These papers will not be reprinted in the Conference report. (Apply to Organizing Secretary, International Garden Cities & Town Planning Federation, 3 Gray's Inn Place, London, W. C. 1, England.)

The Collection of Moneys in the Public Schools.—This problem in the New York City schools was studied by a committee of fifteen and the report was written by a subcommittee of three. June 2, 1924. 50 pp. The report deals with the amounts and objects of the funds collected, the authorizations for them, and the methods employed in raising them. Recommendations are made by the Committee for the regulation of such activities in the schools. (Apply to William J. O'Shea, Superintendent of Schools.)

Social Discovery.—By Eduard C. Lindeman, with an Introduction by Herbert Croly. Published by Republic Publishing Company, 421 West 21st Street, New York, N. Y. 1924. XXVII + 375 pp. An approach to the study of functional groups. Paper, $1; cloth or boards $2. Paper-covered copies can be rebound in cloth or boards for $1, the cost price. (Apply to the publishers.)

Committee of the Permanent Charity Fund Incorporated, Boston.—Seventh Year Book, covering the activities of the Committee and of the Boston Safe Deposit and Trust Company, Trustee of Permanent Charity Fund, for year ending June 30, 1924. 57 pp. Showing the scope and purpose of the Fund and how gifts may be made to it, and covering not only the appropriations, receipts and disbursements for the year, but a review of the seven years' work of the Committee, with an alphabetical list of the organizations helped and brief statements of their work. (Apply to the Fund, 100 Franklin Street, Boston, Mass.)

The Selection of Jurors.—By Clarence N. Callender. A comparative study of the methods of selection and the personnel of juries in Philadelphia and other cities. A thesis in political science presented to the University of Pennsylvania. 1924. 107 pp. Bringing out the desirability of reform, and the changes that such reform would involve, with the expense. (Apply to the University, at Philadelphia, Pa.)

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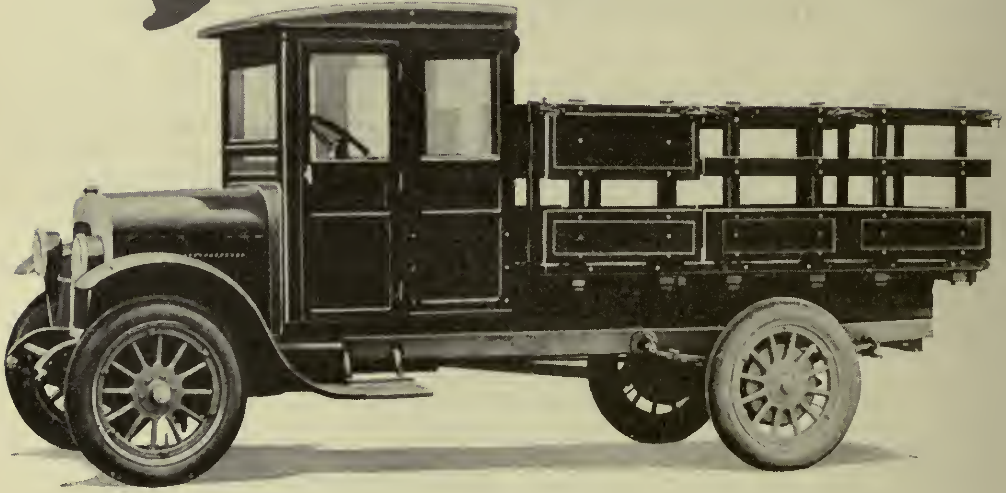

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Motor Vehicle Traffic.—Proceedings of a Conference on Motor Vehicle Traffic, held under the joint auspices of Yale University and the state of Connecticut, in New Haven, April 9-11, 1924, with special reference to regulation, control, and safe operation. Edited by Richard Shelton Kirby, Department of Civil Engineering, Yale University. Published for The Hartley Corporation by the Yale University Press. 1924. 179 pp. Illustrated. Containing papers by authorities on the following subjects: Connecticut Motor Vehicle Accident Statistics; The Law of the Highway; The Mind of the Operator; Education of School Children and of the Public on Traffic Accident Prevention; Highway Improvement to Prevent Accidents; Highway Traffic Regulation and Control; Police Control; Laws and Court Systems; Motor Vehicle Department Procedure; The Health Hazards of Exhaust Gas; Street Railways and Motor Vehicles; Public Service Motor Vehicles; and Traffic Policing. Apply to the publishers.)

Civic Conditions in Colorado Cities and Towns.—Report on the survey of such conditions in Colorado municipalities of 2,000 or over. By William L. Bracy, of the Bureau of Business and Governmental Research, Extension Division, University of Colorado, Boulder, Colo. 20 pp. Tables and 16 charts showing the ranking of 29 cities during fiscal years beginning (with two exceptions) in 1922 and ending in 1923. The basis of the ranking is the services and costs in relation to police, fire, and health protection, street improvement, library service, water-supply, park facilities and elections. 25 cents. (Apply to the Bureau.)

Thrift Education.—The report of the National Conference on Thrift Education, held in Washington, D. C., June 27 and 28, 1924, under the auspices of the Committee on Thrift Education of the National Education Association and the National Council of Education. 79 pp. Some 150 national organizations interested themselves in the Conference and many of their representatives took prominent part in the program. 50 cents. (Apply to the National Education Association, 1201 Sixteenth Street N. W., Washington, D. C.)

Financial Statistics of Cities Having a Population of Over 30,000, 1922.—Showing the financial transactions of 261 cities, the assessed valuation of taxable property in those cities and the taxes levied thereon during the fiscal year 1922, and their indebtedness and specified assets at the close of that year. Giving, for the whole city and its important departments, the revenue collected, the cost of conducting municipal business and the indebtedness incurred for meeting this cost. Convenient size—6 by 9 inches. 307 pp. Diagrams, tables. 75 cents (buckram). (Apply to the Government Printing Office, Washington, D. C.)

Building Codes in City Development.—A pamphlet of 12 quarto pp. issued by the National Lumber Manufacturers Association, dealing with the fundamental requirements of a building code, which are universally applicable, needing only to be modified by local conditions to form the basis for building code legislation in any city. (Apply to the Association, Transportation Building, Washington, D. C.)

Ohio Motor Bus Lines.—Highway Time Tables, published quarterly for the Ohio Motor Bus Owners' Association, by the American Highway Educational Bureau, Washington, D. C. 55 pp. Handy size. Map of highway passenger lines in Ohio. Improved transportation facilities build local trade; this folder has been issued to aid in the upbuilding of better trade and social advantages in Ohio communities. (Apply to the publishers.)

When Disaster Strikes.—Suggestions for Red Cross chapters. Published by The American National Red Cross, Washington, D. C. 1924. 31 pp. Forms for reports. The objects of the pamphlet are to encourage chapters of the American Red Cross to adopt measures of preparedness for relief in case of disaster, and to present the essentials of a plan of chapter preparedness for, and participation in, disaster relief. (Apply to The American National Red Cross.)

A New Charter Milwaukee's Urgent Problem.—Issued by Citizen's Bureau of Milwaukee, August, 1924. A study of the proportional representation-city manager type of government, issued in order to be of service to the people in clarifying the possible application of this form to Milwaukee. 26 pp. (Apply to the Bureau).

Municipal Reports Received

Clarksburg, W. Va.—Annual Report, year ending June 30, 1924

Detroit, Mich.—Annual Report, Public Schools, year ending June 30, 1924

Kansas City, Kans.—Annual Report, Department of Water, Light and Power, 1923

Oak Park, Ill.—Annual Report, Playground Board, 1923

Pasadena, Calif.—Annual Report, Health Department, year ended June 30, 1924

Rockford, Ill.—Financial Statement, Board of Commissioners, 1923

On the Calendar of Conventions

November 5-8.—Houston, Texas
Texas Association of Sanitarians. Annual Short School for Sanitarians, in cooperation with the Texas State Board of Health. Secretary, E. G. Eggert, Texas State Board of Health, Austin, Texas.

November 7-11.—Columbus, Ohio
American Country Life Association. Annual conference. Secretary, Henry Israel, Room 1849, Grand Central Terminal Building, New York, N. Y.

November 10-12.—Cambridge, Mass.
National Municipal League. Annual meeting. Secretary, H. W. Dodds, 261 Broadway, New York, N. Y.

November 10-12.—Cambridge, Mass.
National Association of Civic Secretaries. Annual meeting. Secretary, Robert E. Tracy, 313 South Broad Street, Philadelphia, Pa.

November 11.—New York, N. Y.
Society of Terminal Engineers. Annual meeting. Secretary, Charles H. Newman, 36 Warren Street, New York, N. Y.

November 13-14.—Akron, Ohio
Association of Urban Universities. Annual meeting. Secretary, Dean Frederick B. Robinson, College of the City of New York, New York, N. Y.

November 17-19.—San Francisco, Calif.
Association of State Highway Officials. Annual meeting. Secretary, Charles Upham, State Highway Engineer, Raleigh, N. C.

November 19-22.—Cincinnati, Ohio
American Social Hygiene Association. National Social Hygiene Conference. Secretary, Donald R. Hooker, M. D., 370 Seventh Avenue, New York, N. Y.

November 20-21.—Toronto, Ont.
Ontario Associated Boards of Trade and Chambers of Commerce. Annual meeting. Secretary, T. Marshall, Royal Bank Building, Toronto, Ont.

December 1-4.—New York, N. Y.
American Society of Mechanical Engineers. Annual meeting. Secretary, Calvin W. Rice, 29 West 39th Street, New York, N. Y.

December 8-9.—Great Falls, Mont.
Montana Association of Commercial Organization Secretaries. Annual convention. Secretary, Lyman E. Jones, Great Falls, Mont.

December 11-13.—Indianapolis, Ind.
National Society for Vocational Education. Annual convention. Secretary, F. G. Nichols, Harvard University, Cambridge, Mass.

December 15-17.—Washington, D. C.
National Conference on Street and Highway Safety, called by Secretary Herbert Hoover. Address Department of Commerce, Washington, D. C.

December 26-27.—Chicago, Ill.
National Community Center Association. Annual meeting. Secretary, LeRoy E. Bowman, 503 Kent Hall, Columbia University, New York, N. Y.

January 5-6.—Chicago, Ill.
International Association of Street Sanitation officials. Annual conference. Secretary, A. M. Anderson, 10 South La Salle Street, Chicago, Ill.

January 6-9.—Chicago, Ill.
American Road Builders' Association. Annual convention and Food Show. Secretary, Ethel A. Birchland, 37 West 39th Street, New York, N. Y.

January 12-14.—Boston, Mass.
American Society of Landscape Architects. Annual meeting. Secretary, Bremer W. Pond, 18 Tremont Street, Boston, Mass.

January 21-23.—New York, N. Y.
American Society of Civil Engineers. Annual meeting. Assistant Secretary, C. E. Beam, 33 West 39th Street, New York, N. Y.

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News and Illustrations

Items of Interest to City, Town and County Officials, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

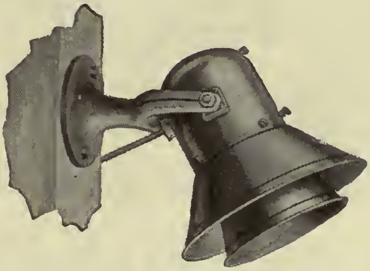
Trucks Pass Underwriters' Tests

Two GMC trucks, made by the General Motors Truck Company, Pontiac, Mich., successfully passed the rigid tests of the National Board of Fire Underwriters, according to a recent announcement of the officers of the International Association of Fire Engineers. The tests were made at the convention of the Association at Buffalo in August, and the GMC was the only commercial truck to enter and successfully pass the requirements. The test required that the truck, equipped with pumping apparatus, must pump from 300 to 400 gallons of water a minute for 12 consecutive hours without stop. This official test qualifies the GMC truck for fire department use without further tests anywhere in the country.

The General Motors Truck Company has announced the sale of 125 heavy-duty motor trucks to the city of New York. This new fleet, which is one of several large GMC fleets in operation in Greater New York, is to be used largely in garbage disposal and street-cleaning work, practically all of the units being equipped especially for these purposes.

Traffic-Warning Sirens Cut Down Fire Losses

The Federal Electric Company, Chicago, Ill., has brought out a device which should be helpful in reducing fire losses. It consists of a series of electric sirens placed at intervals along through-streets. This siren sounds a piercing, unmistakable note when the fire trucks are coming, instantly clearing the street of traffic, leaving a clear passage for the fire department.



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Put a Van Dorn *Mechanical* Hoist on every truck you own and free yourself from all the troubles of ordinary hoists. Van Dorn Hoists are *gear-driven;* oil is used for lubrication *not for operation.* This means faster dumping and positive action at all times. Send for catalog fully explaining the *Mechanical* principle of Van Dorn Dump Truck Hoists.

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DUMP TRUCK
HOISTS & BODIES

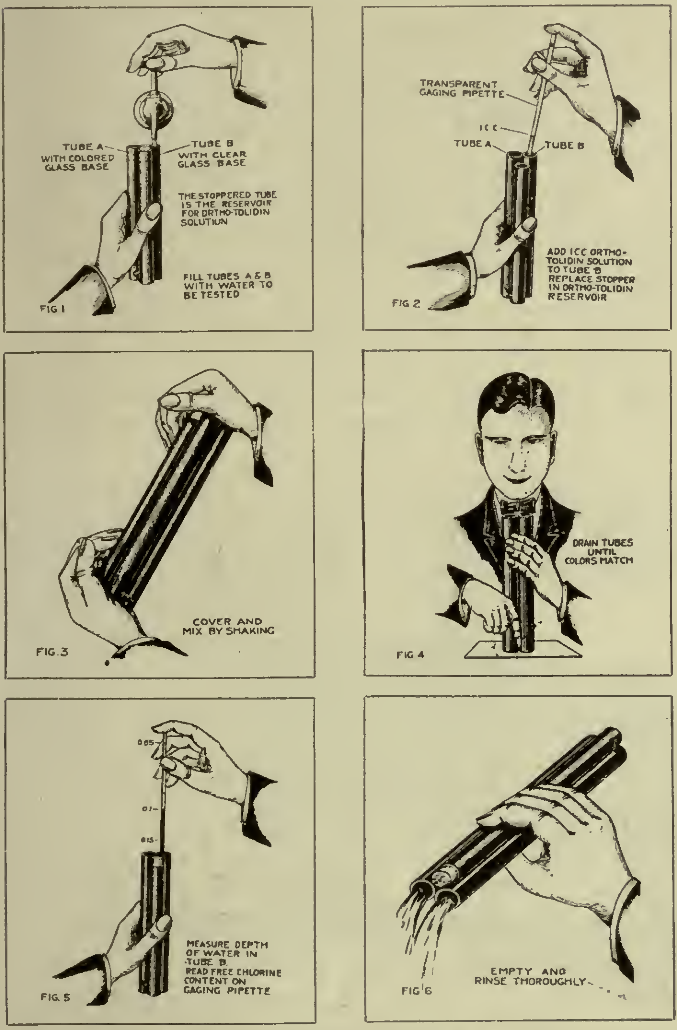
Cities, such as Springfield, Mass.; Hartford, Conn.; Knoxville, Tenn.; Selma, Ala.; and Flint, Mich., that have installed this system report that the time consumed in getting to fires is greatly reduced, with consequent reduction in fire losses, and that the chance of accident has been almost eliminated. The reduction in fire loss pays for the installation many times over, and the lessening of the danger to life and property through accident is incalculable.

Testing for Free Chlorine

In the sterilization of water by chlorine, it is generally agreed that maximum results are secured when sufficient chlorine is applied to the water to leave a slight excess for a few minutes after treatment. This excess is usually spoken of as residual or free chlorine. Authorities differ as to the amount of free chlorine that should be in water to insure its freedom from microbes of disease, but in general it is believed that 0.1 parts per million of free chlorine 10 minutes after treatment is sufficient. Too much chlorine might cause taste, while too little would impair bacterial efficiency.

When ortho-tolidin solution is introduced into a water containing free chlorine, the water turns yellow or orange. The intensity of the color varies with the amount of free chlorine. A scientifically calibrated testing outfit has been devised by the Wallace & Tiernan Co., Inc., Newark, N. J., which permits the operator to watch the color of the ortho-tolidin-treated water against a known color standard and to interpret the result in parts per million of free chlorine at once. This outfit consists of a 2-tube color comparator with a small transparent gaging tube, calibrated both to measure ortho-tolidin solution and to indicate free chlorine in parts per million. One of the color comparator tubes has a colorless glass base, while the other is fitted with a colored glass which corresponds to a value of 0.05 parts of chlorine per million.

The color comparator tubes are opaque, the interior walls being threaded. This construction eliminates the error due to light refraction which is experienced when glass tubes are used, and also overcomes difficulties in reading due to reflected light on the sides of the tube. Each of the comparator tubes is fitted with a small valve at its base for lowering the level of the solution in the tube. This fundamental feature makes it possible when comparing colors to look through the same depth of liquid in both tubes, and eliminates any error due to the natural color of the water being tested. For convenience in carrying, a third tube is assembled with the comparator tubes and serves as a reservoir for the ortho-tolidin solution. The accompanying illustration shows the method of using the tubes.


TUBE A WITH COLORED GLASS BASE
TUBE B WITH CLEAR GLASS BASE
THE STOPPERED TUBE IS THE RESERVOIR FOR ORTHO-TOLIDIN SOLUTION
FILL TUBES A & B WITH WATER TO BE TESTED
FIG 1
TRANSPARENT GAGING PIPETTE
1 CC
TUBE A
TUBE B
ADD 1CC ORTHO-TOLIDIN SOLUTION TO TUBE B REPLACE STOPPER IN ORTHO-TOLIDIN RESERVOIR
FIG 2
COVER AND MIX BY SHAKING
FIG. 3
DRAIN TUBES UNTIL COLORS MATCH
FIG 4
0.05
0.1
0.15
MEASURE DEPTH OF WATER IN TUBE B. READ FREE CHLORINE CONTENT ON GAGING PIPETTE
FIG. 5
EMPTY AND RINSE THOROUGHLY
FIG 6

HOW TO USE NEW APPARATUS TO TEST FOR FREE CHLORINE IN STERILIZED WATER

A Machine for Forced Bleeding of Creosoted Blocks

The forced bleeding of tarred or creosoted block floors or pavements, or the ironing out of bituminous floors or pavements, is the purpose for which a new device has been recently produced by the Chausse Oil Burner Company, Elkhart, Ind. This machine is a large, flat iron or squeegee, equipped with a kerosene-burning torch, which has shown itself to be successful in the treatment of floors. While it was designed primarily for repair work in softening floors and pavements, it was found also to be adaptable to new work where any warming effect is desirable. It has also been used in warming concrete floors which are to be covered by wax or rosin before painting, and binds

Can your town match these stories of paving economy?

Vicksburg, Mississippi Vicksburg citizens claim that 3 blocks of Washington Avenue, in Vicksburg, hold a record for heavy traffic. The 3 blocks in question were paved with brick in 1906. The same brick are in service today, relaid, after the first 15 years of use, with another face up. Another 15 years of usefulness at least is expected.

Omaha, Nebraska In 1902 1½ miles of Lake Street were paved with brick. By 1923 the street, a heavy traffic thoroughfare, needed attention. On tearing up the old pavement *85% of the old brick were found in excellent condition and were relaid on a new base,* no doubt for another twenty-one years of service.

Cambridge, Massachusetts Between 1901 and 1905 Cambridge laid approximately ten miles of brick pavements on streets where the considerable traffic was concentrated by street railway tracks. Today, these pavements are still in service (average age 20 years) and little maintenance expense has been required.

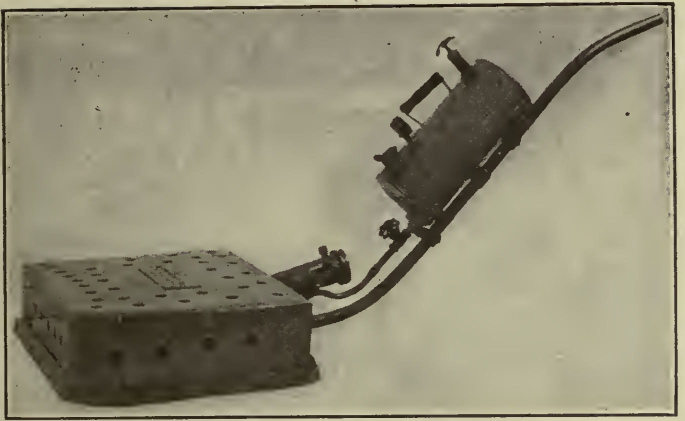
Bucyrus, Ohio South Walnut Street, paved with brick 30 years ago, is traveling along toward a half-century of service. One block was recently taken up, the brick turned over and relaid. South Sandusky Street, brick-paved thirty-three years ago, is still in service. Warren Street, brick-paved, has carried heavy hauling for thirty-one years on the original surface.

VITRIFIED Brick PAVEMENTS

O U T L A S T   T H E   B O N D S

NATIONAL PAVING BRICK MANUFACTURERS ASSOCIATION, ENGINEERS BLDG., CLEVELAND, OHIO

Advocate Brick—
the pavement that outlasts the bonds.



A MACHINE FOR BLEEDING CREOSOTED WOOD BLOCK PAVING AND FLOORS

the material to the concrete so that the paint does not peel.

In spite of the intense heat produced by the torch, it will not burn block or asphalt and will only brown paper because the heat is so well distributed over the pavement. The machine brings tar to the surface so that it may be scraped off, and warms asphalt so that it can be rolled or tamped. It is not intended for the type of street repairing now done by surface heaters. The torch furnished is a standard 3-gallon Chausse kerosene torch, which may be detached for other uses and carries sufficient fuel for 3 hours' continuous operation.

Iron Railing Along Deep Ravine

The accompanying illustration shows an Anchor Post iron fence erected by the city of Easton, Pa., for 1,800 feet on College Avenue. This avenue has a decided grade, and the sidewalk is at the edge of a steep declivity, descending in some places to a depth of about 300 feet. The purpose of the railing is to keep people fron falling off the edge. It also serves well in the case of an automobile that might be out of control, as it will stop a passenger car traveling at ordinary speed.

This railing is 3 feet 6 inches high and made of grooved pickets ¾-inch square. The pickets are welded to horizontal rails in pairs. The welding is done electrically by means of the combined action of heat and pressure. This causes the flanges of the several members to sink into each other and to fuse together at all points of contact.

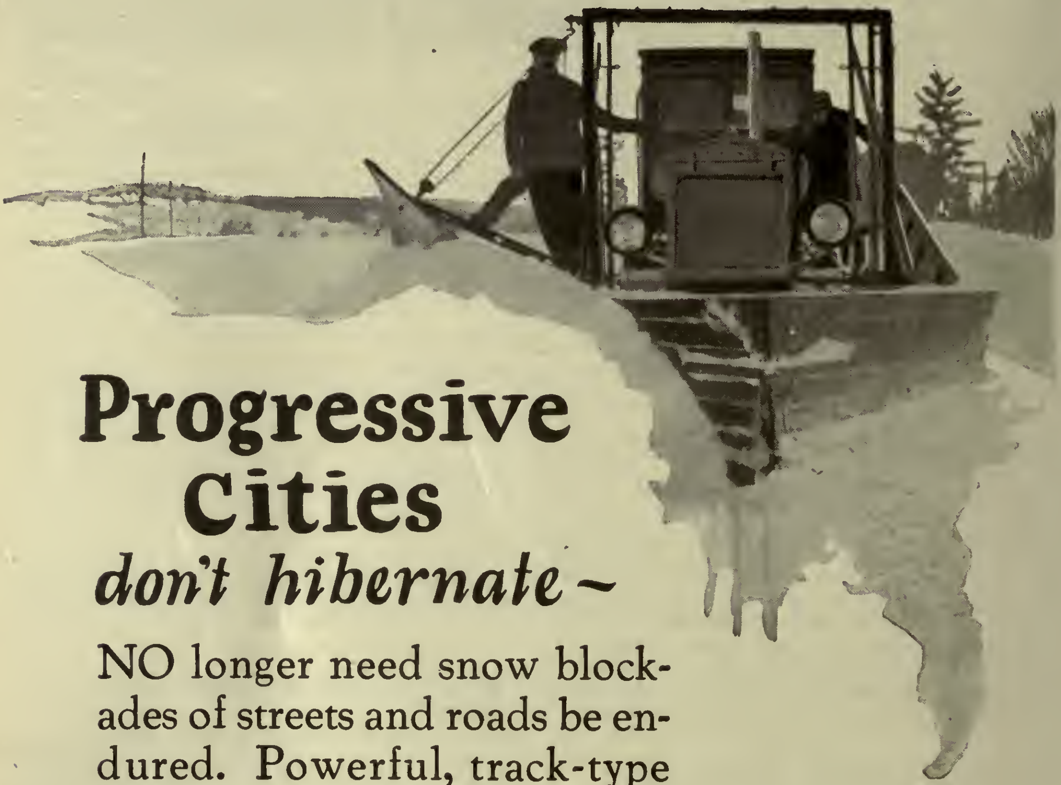
It is interesting to note that the specifications drawn up for this fencing required that it should be low in up-keep cost, and have great rigidity and strength, as well as artistic simplicity of design. The bid of the Anchor Post Iron Works, Garwood, N. J., was accepted because it was the only railing that filled all requirements, in spite of the fact that it was the highest bid entered.

Since the construction of this fence, Easton has placed another order for Anchor fencing for 1,000 feet to be installed on Smith Avenue, a similar hill in another part of the town.

Hirst Joins American Vibrolithic Corporation

The American Vibrolithic Corporation, 933 Insurance Exchange Building, Des Moines, Iowa, has announced that Arthur R. Hirst, for 17 years Chief Engineer of the Wisconsin State Highway Commission, has been appointed Chief Engineer of the Corporation and will devote his entire time to the technical and engineering features of Vibrolithic concrete pavement and bases.

STURDY IRON FENCE AT EDGE OF STEEP RAVINE



Progressive Cities

don't hibernate~

NO longer need snow blockades of streets and roads be endured. Powerful, track-type BEST TRACTORS pushing snow plows will quickly clear away the drifted snow of winter storms.

Traffic should go on in winter just as in other seasons. Freight has to be moved in order that commerce may not be interrupted. Fire departments, doctors and ambulances must respond when needed, and children must get to school.

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BEST TRACTORS

Chausse Opens Elkhart Factory

The Chausse Oil Burner Company has announced a change in its address to Elkhart, Ind., where it has completed a new factory on West Beardsley Avenue in conjunction with The White Manufacturing Company, with which it is associated. The factory which these companies have been occupying in Goshen was seriously damaged by fire a short time ago. The new plant, which is constructed entirely of brick, steel and cement, has double the facilities of the old one for the production of Chausse kerosene torches, tool and surface heaters, as well as The White Manufacturing Company's line of railway car parts.

HOLT CATERPILLAR TRACTOR WITH SARGENT PLOW, REMOVING DRIFT FROM SIDEWALK

Tractors Clear Snow from Sidewalks

During the investigation of snow removal and the development of the snow removal business of the Holt Manufacturing Company, Peoria, Ill., it was found that the removal of snow from sidewalks was an important matter. Holt Caterpillar 2-ton tractors have been used successfully in many places for this type of work where a proper plow was used. Several different kinds have been built for this service, but it was found that the Sargent plow, which has been developed and improved by the manufacturers, the Union Iron Works, Bangor, Maine, is well suited for use with the Holt 2-ton tractor.

In those sections of the north where the snowfall is pretty constant and sidewalks have to be frequently cleared, it is believed that there will be an increasing demand for the use of the smaller type of tractor equipped with a proper snow-plow. The same reasons that make it necessary to keep the main thoroughfares open for general traffic and emergency requirements apply to keeping sidewalks free from snow in residential as well as business districts. The accompanying illustration was taken last winter in Montreal and shows the type of work which the Sargent plow can tackle when powered by a Holt 2-ton Caterpillar tractor.

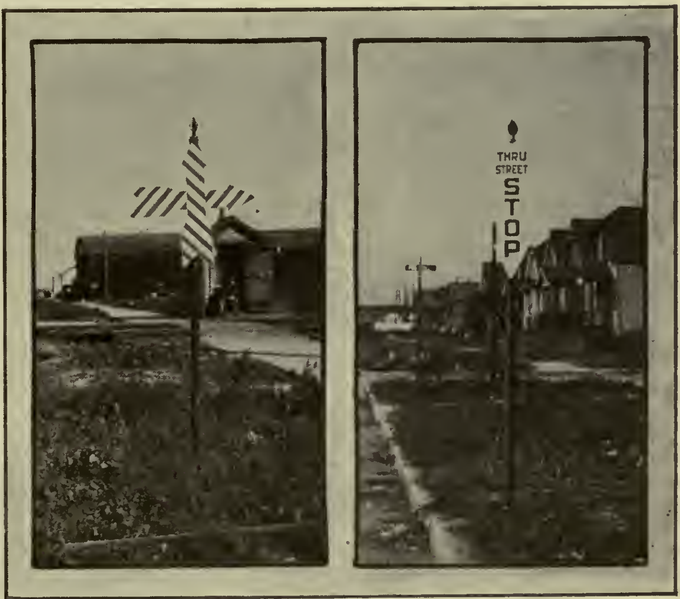
Pacific Flush Tank to Handle New Sewage Pump

The Wood trash and sewage pump invented by A. D. Wood, consulting engineer, New Orleans, La., and described on page 393 of the April, 1924, issue of THE AMERICAN CITY, is being marketed by the Pacific Flush Tank Company, 4243 East Ravenswood Avenue, Chicago, Ill., and Singer Building, New York City.

The Wood trash and sewage pump is not a new affair, as it has been in use successfully in New Orleans for several years. Installations of pumps in New Orleans required originally a considerable amount of maintenance because of rubbish clogging the runners.

Arrow Warning Signs

A complete line of warning signs made up in the form of arrows has been placed on the market by the Union Iron Products Company, East Chicago, Ind. The arrows are made of heavy copper bearing galvanized steel plates, are die-cut and die-folded for stiffening. They are enameled with pyroxylin, a product of gun cotton which is almost identical with the Duco enamel which is becoming so popular with automobile body finishers. The arrows are large enough to attract attention, but small enough not to be obstructive. This type of warning sign was adopted by the International Association of Chiefs of Police at Buffalo in 1923 and again endorsed at its 1924 Montreal convention after Chief Forbis of Gary, Ind., together with others, worked out a set of uniform colors and positions of arrows, both of which play an important part in the effectiveness of the warning signal.



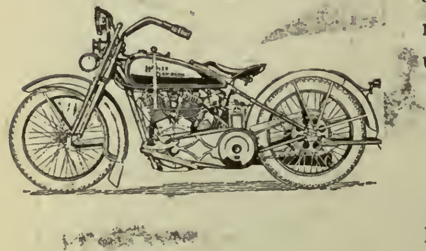
TWO TYPES OF ARROW INDICATORS TO CONTROL STREET TRAFFIC

This detail of New York State Troopers was assigned to escort the Prince of Wales during his recent New York visit.

They Guarded the Prince of Wales

Be Sure to See the New
"Stream-Line"
HARLEY-DAVIDSON

27 improvements on the 1925 models. More speed—more power. Lower riding position. *Yet the price is reduced!* New "Stream-Line" model is the finest Harley-Davidson ever built.



The best was none too good for the Prince of Wales. Hence, the special guard of four New York State Troopers and a Harley-Davidson Police Motorcycle.

Nor is the best too good for the 1891 cities and towns that use Harley-Davidsons for police service. This famous mount—on proved records of economy, durability and year-'round dependability—has become indispensable to the efficient, modern police department.

One Harley-Davidson does more to rid a community of speeding, reckless driving and crime than a dozen patrolmen. Speeders and crooks prefer towns that are less up-to-date—where there are no police motorcycles.

Ask your dealer or write us for special literature on Police Motorcycles—*Free.*

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Harley-Davidson
The Motorcycle

MERRILL MELTING-KETTLE, SHOWING OIL BURNER AND AIR-COMPRESSING UNIT

A New Heating Kettle and a Patching Unit

The Merrill heating kettle, which has recently been placed on the market by Chase & Lyman, Inc., 12 Pearl Street, Boston, Mass., has many features which make it a particularly desirable piece of equipment for the asphalt paving contractor.

The heating unit is an oil-burner which projects a flame into a large pipe located a few inches above the bottom of the sheet steel tank. At the other end of the pipe is a header from which seven smaller tubes return to the flue. Thus heat is applied to the asphalt or tar in such a way that the burning out of the bottom is prevented. The draw-off valve is located immediately in front of the header and therefore is at the hottest part of the tank and cannot plug up.

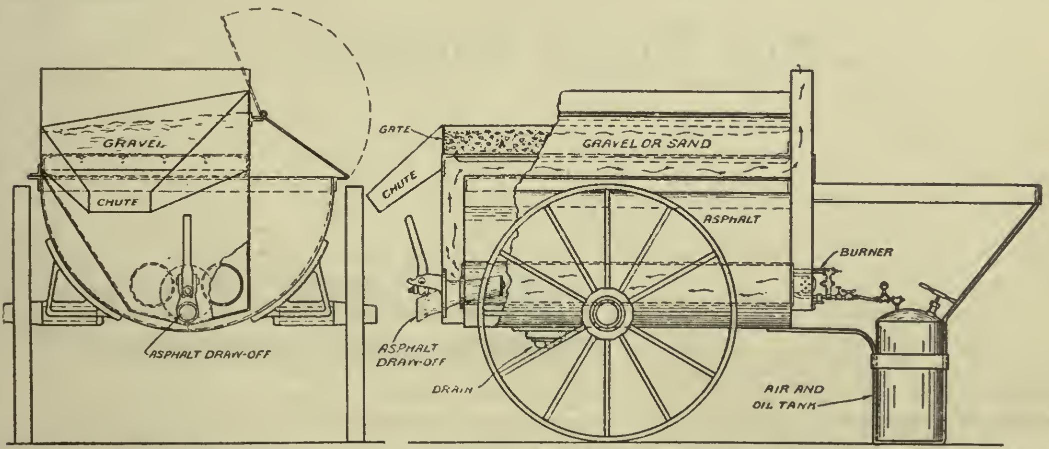
An air-agitating system consisting of three valves located along the bottom of the tank speeds up the mixing of the material, making it possible with a tank capacity of 500 gallons to heat 2,110 gallons a day; the first of which can be drawn off within 30 minutes after the readily controlled oil burner is started.

It is next to impossible to burn out the bottom of this heating kettle, because the heat is not applied from a fire beneath the kettle, but through pipes inside of the kettle. Any small amount of sediment which gets into the kettle through careless handling of the asphalt or tar by the contractor's employees, is readily kept in motion by the air-agitating valves. The average cost of operating the kettle is simply the cost of from two to three gallons of fuel oil per hour, which is small as compared with the cost of wood or coal, which must be stacked, stored and hauled to the heater.

Overheating of the material is prevented by partially shutting off the oil burner as soon as the material has reached the desired temperature. The non-clogging discharge valve, which is especially designed to prevent stoppage and freezing, insures a steady flow of the material. This discharge valve is hand-operated and makes it unnecessary to dip material out of the kettle.

The kettle is mounted on strong steel-rimmed wheels and, if desired, may be equipped with heavy rubber-tired wheels and springs so that it may be drawn behind a truck.

A self-contained patcher unit for road maintenance work, built along the same general lines as the Merrill heating kettle, has also been developed by Chase & Lyman, Inc. The heating unit is similar to that described above, except that there is but one passage of the heat through the kettle. The flue at the opposite end rises to the top of the kettle and then is carried back below the pan on which gravel or sand may be dried. The gases then go up the chimney located at the same end as the burner. By the use of this kettle, which has a hand-operated draw-off valve, the simultaneous heating of the bituminous material and the gravel or sand to nearly equal temperatures is possible. The application of the heat in the manner described eliminates the burning out of the tank bottom, and it is operated at a cost of about 12 cents per hour.



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Who Makes It?

See Pages 4 and 6

And Save Time

Vol. XXXI
No. 6

The American City Magazine

DECEMBER
1924

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Fields of Progressive Legislation for Better City Planning

By Edward M. Bassett

Counsel of Zoning Committee of New York; Director of Legal Division of Regional Plan of New York and Its Environs

Zoning Enabling Acts

A NUMBER of states have either defective enabling acts for zoning or else none at all. Municipalities cannot safely be zoned without a state enabling act. Where possible, a single enabling act should apply to all municipalities in the state. The Department of Commerce, Washington, D. C., will supply an excellent standard law and other informative material. The most usual shortcomings of existing acts are the omission to authorize zoning of density of population, the omission of the requirement of more than a majority of the votes of the council where amendments of the maps are opposed by a considerable fraction of the landowners, and the omission of a provision for a board of appeals with power to vary the strict letter of the law in cases of particular permits. Several states, in which people complain bitterly that their courts are against zoning, have never had a proper enabling act for zoning.

Profiting by Experience and Intelligence

During 1925 the Legislatures of not less than 42 of the 48 states will be in session. To each of these law-making bodies there is opportunity for important public service in the enactment of legislation needed for local and regional progress in city planning and zoning.

A great deal of such legislation in past years has necessarily proceeded by the clumsy method of "trial and error." But practical experience in the operation of these statutes, combined with the studies of eminent lawyers, has now made available advice which has passed far beyond the stage of mere theory. THE AMERICAN CITY has been fortunate in securing, from one of the foremost of these experts in the law of city and regional planning and zoning, the article here published. The suggestions offered by Mr. Bassett will be of great practical value, we are sure, to all who are drafting or desirous of influencing the passage of laws which will help our growing communities to control wisely their physical development.

Local Planning Commissions and State Bureaus

How about legislation to establish city plan commissions? We must not forget that councils, town boards and city engineers have been doing city planning for centuries. Some of it has been excellent and some has been pretty poor. Regardless of state legislative devices, the elected local legislators are, in the long run, the ones who will make and carry out city plans. They hold the purse and they cannot be blamed if they do not like to surrender it to appointed officials. On the other hand, better city planning is needed. States should help councils, not by taking the city planning power out of their hands, but by permitting the establishment of local advisory bodies with a paid staff. State conferences of such advisory bodies stimulate the best sort of city and regional planning. States can well establish bureaus supported by state funds to advise municipalities on planning. Massachusetts and Pennsylvania have taken the lead in this direction. In many states, small municipalities have no place to turn to for professional advice and help. A central state bureau can serve many cities and villages which if left to themselves do not know how to do or whom to employ, and so they do nothing.

Planning Beyond the City's Limits

Some cities have been given the power to extend the city plan beyond the city limits. The desirability of this power seems evident, because the street and park system beyond the city limits ought to harmonize with the city plan. Many insist that this power should be given to all cities of a state by general legislation. It would, however, be more discriminating to give this power to cities only where they are not contiguous to other cities or villages. For instance, New York and Yonkers are contiguous. If the State Legislature empowered all cities to lay out streets and parks three miles beyond the city limits, Yonkers would have as much right to plan a northern zone of New York as New York would have to plan a southern zone of Yonkers. We can imagine the indignation of villages around Boston, Chicago and Philadelphia if the big city tried to impose its city plan on them without their consent. Home rule is desired by every competent municipality, and the best sort of city planning will recognize this trait of human nature. But no municipality objects to cooperation with its neighbor to bring about a harmonious street system, especially if a state or county planning bureau, having a paid staff, can assist in bringing them together on a sensible layout. The probabilities are that this subject of power to plan beyond the city limits should be inserted in some city charters and not in others, and should not be part of a general law for all cities of a state. Isolated cities can well be given this power.

Regional Park Systems

While for general city and regional planning state legislatures should favor advisory commissions with staffs, and give due regard to home rule, the creation and control of regional park systems by commissions with power is turning out to be the right method. Municipalities like it; and although it involves a surrender of home rule, they are often willing to contribute to the cost. The municipalities around Los Angeles willingly combine to support a flood control commission with power, because the municipality nearest the mountains must pass on the flood water to its neighbor further down the slope, and it in turn to the neighboring municipality near the sea. The reason why they all surrender home rule in this respect is because the flood water would otherwise be without control. The sum and substance of the whole matter is that each municipality insists on handling its own streets, small parks and zoning. At least it wants the power of control. It is usually willing to take and follow good advice from the outside. But matters like regional parks, regional sewers and regional flood control, it willingly surrenders to a commission with power, because that is the only way to get results.

Assessments for Public Improvements

No state can expect its municipalities to carry out efficient city planning unless it gives them adequate power to levy assessments on areas benefited by public improvements. The cost of street openings, pavements and sidewalks, park openings and sewers it should be possible to assess in whole or in part. Greater New York has developed a remarkably flexible procedure in such assessments: the cost of an improvement can be assessed in whole or in part on an area of assessment; different zones can be established for this purpose; part of the cost can be thrown on any one of the five boroughs, or part on the city at large; assessments can be converted on application of the landowner into ten annual instalments, one of the instalments becoming a lien on the land each year.

Control of Real Estate Subdivisions

Probably the most fertile cause of irrational street layouts is the freedom with which private developers can create additions without regard to a harmonious official plan. Narrow streets are produced where they should be broad, and vice versa. Awkward jogs and culs-de-sac are created. Direct main thoroughfares are made almost impossible when needed. Buildings are erected in the wrong places. The expense of replanning prevents doing the planning over again. Some state legislatures have prohibited the filing of plats in official recording offices until they are approved by the municipality. This is a move in the right direction. It is not a complete remedy, however, for developers can still sell off their building lots by metes and bounds, and refrain from filing plats. Accordingly, some states have tried to prevent sales except by reference to filed plats. This has not worked very well, because these laws have usually tried to compel the dedication of the streets by the developer. Compulsory dedication is an indirect way of taking private property for a public use without compensation and is probably unconstitutional. Every such law should provide that the developer need not dedicate the streets and that he can make a notation to that effect on the plat. In one way or another the streets will eventually become public.

Preventing Buildings in Mapped Streets

The problem of how to prevent buildings in mapped streets before they are opened is just about as serious. To-day, except in Pennsylvania, an owner of land within the bed of an officially mapped street can erect a building in it if the street is not yet legally opened and then insist on full damages when the opening takes place. It is easy to say that every official street should be immediately opened. But a moment's consideration will convince one that sound planning for the future requires determination of street and park locations before the approach of actual building. Farms cannot be cut up prematurely, yet the future street plan should be determined twenty-five or fifty years before actual improvement. When determined, it should be stabilized. City officials can hardly be expected to lay out future streets with great care and forethought if landowners can freely erect structures in the beds of mapped streets, thus compelling constant changes of the plan.

Is there a lawful method of preventing structures in mapped streets before the streets are legally opened? The proposed new charter of Greater New York prepared by the recent Charter Commission contains a method of accomplishing this that is undoubtedly lawful. The building commissioner cannot grant a permit to build in the bed of an unopened street. The applicant may, however, apply to the board of appeals, which has power to grant a permit with conditions that will limit the proposed structure to a comparatively inexpensive sort and yet assure a fair return on the investment. It is regulation, not appropriation. This plan is based on the principle that the official city plan is established under, and protected by, the police power, that is, for the health, safety and general welfare of the community. The new charter for Nassau County, New York, contains substantially this provision. This plan has been approved by the present administration of Greater New York, and a bill to enact it was placed before the last session of the state legislature by the corporation counsel, but failed to pass. Planning commissions of Massachusetts are advocating another method to accomplish the same result. Legislation is sought empowering municipalities to condemn an easement in favor of the public over the bed of unopened streets, preventing structures pending opening. This follows the analogy of a Massachusetts law now meeting with success which allows the establishment of setback building lines under eminent domain. The municipality simply appropriates the easement constituting the setback, leaving the owners to present claims within a fixed time. The owners seldom or never do this, because their benefit is usually as great as their damage. Thus the municipality virtually obtains the setback by default of owners.

The New York method has the advantage of automatic application to every mapped and unopened street, whereas official action must take place regarding each street under the Massachusetts plan. The New York method is under the police power; the Massachusetts method is under eminent domain. Both plans would allow temporary structures. The Massachusetts plan is not adapted to the legislative methods of New York and other states where owners in condemnations by municipalities are made parties to an action and if the parties do not appear awards are made to unknown owners. In the latter situation some owners will always make formal claims for damages, and this virtually compels others to do the same whether they want to or not.

Providing Areas for Playgrounds

Playground legislation will yearly come more insistently to the front. Street danger from automobiles is largely responsible for this. Legislative methods of compelling the automatic setting aside of small parks by developers, the same as they are now compelled to set aside streets, will be perfected. This requirement should be brought under the police power; that is, it should be fairly based on the health and safety of the community. The automatic method should apply only to areas entirely undeveloped for community habitation, and care should be taken that the statute does not compel dedication. In built-up areas and areas with an opened street system, it would doubtless be unreasonable to require the gratuitous setting aside of small parks. In such areas municipalities must provide playgrounds (small parks) by purchase with public funds, or by assessing the cost on the benefited district.

Selecting Our Fire Fighters

High Mental Standards More Important Than Exceptional Physical Endowments

THE possibility of improving the methods of selecting fire fighters is interestingly discussed in an article by F. A. Moss and Fred Telford in the October number of *Public Personnel Studies,* published in Washington, D. C., by the Bureau of Public Personnel Information. The authors of the article express the opinion that civil service commissions in the past have been quite successful, through the examinations they give, in getting a good type of men for this work; but at the same time, they point out, the tests in use can be materially improved. They present in detail the modified tests which they recommend.

Too much emphasis, according to Mr. Moss and Mr. Telford, has heretofore been placed on physical attainments and too little on mentality in selecting fire fighters. They point out that the age and weight limits at present bar out many men slightly below the average weight for their height; but that these barred men, in many instances, are better able to perform the duties of a fire fighter than many of the larger men accepted. Especially does it seem to the authors a dangerous policy to insist that the men who enter the fire department at the ages of 20 to 30 be above the normal weight for their height at that time, as these same men, if they remain in the service (as most of them do), will by the age of 35 or 40 take on so much flesh that it will be difficult for them to climb a ladder carrying a heavy hose and to perform the other heavy work required of fire fighters.

Even worse, according to Mr. Moss and Mr. Telford, is the common practice of adopting such high physical standards and putting so much emphasis on mere size and strength that the civil service commissions have been forced to lower their mental standards to such an extent that their tests let through men with mentality little above the moron level, provided they are exceptionally endowed physically. In shifting the emphasis from the physical to the mental basis, they would not eliminate the physical tests but would give them a comparatively low weight and would also fix the minimum standards so as to make it possible for individuals somewhat below the average height and weight to pass the tests. The main thing from the physical standpoint, they assert, is to secure men in physically good condition with sufficient strength and agility satisfactorily to perform their duties and to protect their own and their fellows' lives.

Two Classes of Mental Tests

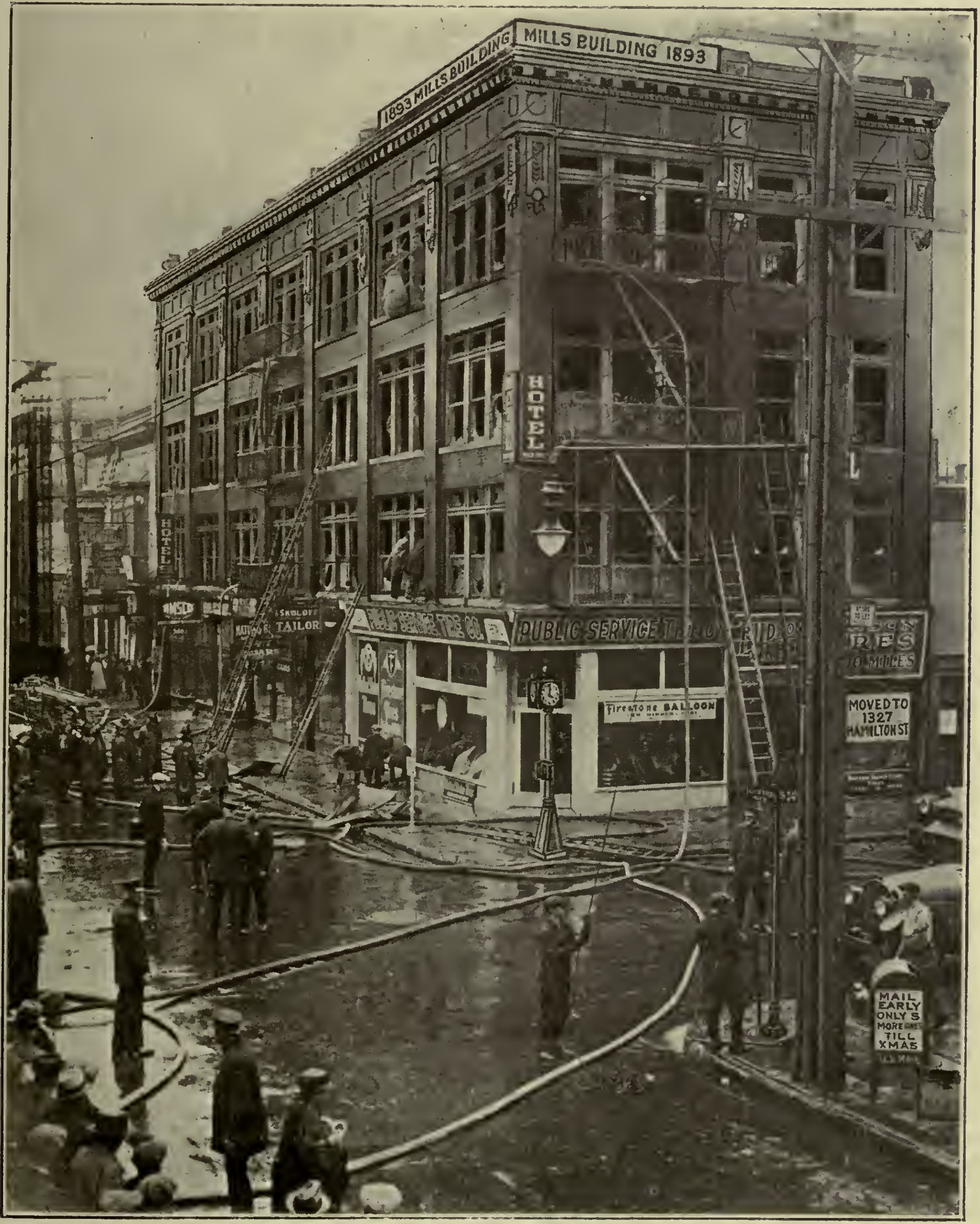
The mental tests proposed fall into two classes: first, a general intelligence test of the army alpha type; and second, specialized intelligence tests very largely in terms of the duties which the men will be called upon to perform as fire fighters. The following is a list of the tests suggested:

Nature of Tests	Suggested Time (Minutes)	Suggested Weight
Test 1.—One of the five alternative forms of the army alpha intelligence tests (A minimum required score of 55 on the army alpha scale is suggested.)	60	2
Test 2.—Accuracy of observation (20 questions based on a photograph of a fire scene, to be answered from memory.)	15	1
Test 3.—Understanding of printed material relating to a fire fighter's work (20 questions based on the content of printed or typewritten material placed in the hands of competitors when the test is given and dealing with some phase of fire fighting or with the rules and regulations of the department.)	20	1
Test 4.—Information and judgment (20 questions in the so-called multiple choice form, with 4 answers from which to choose, each question dealing with some item of information which a fire fighter ought to have or with some matter of judgment.)	15	1
Test 5.—Memory for verbal orders (10 questions on one or more verbal orders, such as may be given to a fire fighter by his superior, to be answered from memory.)	10	1
Test 6.—Education and experience	10	1
Test 7.—Medical tests of physical condition and physical tests of strength and agility	..	3

The limitations of space make it impossible to reproduce the proposed tests in full, but that on accuracy of observation, just as it is recommended, is as follows:

Test 2—Accuracy of Observation

Directions to the examiner: Pass out the sheets containing the picture of the fire in the corner building, placing a sheet face down on the desk in front of each competitor. Secure the attention of the competitors and make some such announcement as this: "The sheet face down on the desk before you contains a picture of a large fire. When I give the signal you are to turn over this sheet and study all you see in the picture for five minutes. Later the picture will be taken up and you will be asked to answer 20 questions about it. These 20 questions will be about such things as the time and place of the fire, how it occurred, what damage was done, and other facts such as a fire fighter ought to note. If you wish to, you may make notes about the things you see in the drawing and use these notes in answering the questions which will be asked you later. Remember that you are to have just five minutes to study the picture and that you will have to answer 20 questions about it from memory or from your notes. Are you ready?" When all are ready, have them turn over the sheets containing the picture and allow them to study it for five minutes. Then collect the pictures. Distribute the question sheets, giving one to each competitor, and allow



PICTURE USED FOR TEST OF ACCURACY OF OBSERVATION

10 minutes for answering the questions. Then collect the answer sheets:

1. At what street intersection did the fire occur? ....
2. How many stories are there in the building in which the fire occurred? ....
3. How many fire escapes can be seen on this building? ....
4. What, if anything, is there to indicate that the fire started in the corner store? ....
5. What business concern occupies the corner store? ....
6. What is the name of the hotel? ....
7. When was the hotel built? ....
8. As indicated by its sign, what kind of hotel is it? ....
9. How many fire vehicles can be seen? ....
10. What is there to indicate that several more fire vehicles have responded to the call than can be seen in the picture? ....
11. What was the highest story to which fire ladders were placed? ....
12. What are the men in the window of the upper story preparing to do? ....
13. What, if any, provision to take care of the injured can be seen? ....
14. What is there to indicate that danger in the building from live electric wires has been eliminated? ....
15. Did the fire occur in the daytime or at night? ....
16. At approximately what hour was the picture taken? ....
17. About what date did the fire occur? ....
18. What indicates that part of the first floor of the building was not occupied at the time the fire occurred? ....
19. How far would you estimate it is from the building to the nearest fire alarm box? ....
20. Name two special fire hazards run by a building occupied by such businesses as those represented in the picture.
    (a) ....
    (b) ....

Oiled Earth Roads on Long Island

By A. T. Goldbeck

Chief of Division of Tests, U. S. Bureau of Public Roads

A TYPICAL OILED EARTH ROAD ON LONG ISLAND

ONE of the very objectionable features of an untreated sand-clay or top-soil road is the dust created by traffic when the road surface is dry. Another objection is the expense of constant dragging to keep the surface in a smooth condition. Under some conditions the rate of wear of such roads amounts to as much as an inch a year, and additional material must be placed on the surface to replace that worn away. On Long Island these objectionable features seem to have been overcome by the use of oil applied to the surface in a particular manner.

The writer inspected a number of these roads on the southern part of the island, extending from Bay Shore to East Hampton. The soil in general is of a sandy nature, and the roads which have been treated are quite typical of sand-clay and top-soil construction. It was stated that the best results are obtained when the material is of such a nature that it is well bonded together. It must be capable of supporting heavy truck loads under ordinary weather conditions without appreciable indentation under the wheels. If the soil is practically pure sand, it will be necessary first to bond the surface with a clay or loam admixture, and, similarly, if the soil is clay, it should be treated by the addition of an admixture of sand. In the first table analyses of soil samples taken from untreated roads compared with typical sand-clay mixtures will give an idea of the nature of the surfaces treated:

ANALYSES OF SAMPLES TAKEN FROM ROAD SURFACE BEFORE OILING, COMPARED WITH TYPICAL SAND-CLAY MIXTURES

	Sample No. 1	Sample No. 2	Characteristics of Typical Sand-Clay Surfaces		
			Class A Hard	Class B Medium	Class C Soft
	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
Retained on 20-mesh..	3.1	3.4	45-60	30-45	20-30
Passing 20, retained on 60-mesh........	38.2	53.9			
Passing 60, retained on 100-mesh.......	6.3	8.5			
Passing 100, retained on 200-mesh.......	3.7	3.5			
Total sand........	51.3	69.3	65-80	60-70	55-80
Silt	30.5	20.1	0-15	10-20	10-20
Clay	18.2	10.6	9-18	15-25	10-25
Total	100.0	100.0	....	....	....
Total sand (retained on 60-mesh)	41.3	57.3	....	....	....
Coarse material (over 10-mesh)	2.8	0.5	....	....	....

It will be noted that sample No. 1 is not of as high quality as desired even for a class C sand-clay road, while sample No. 2 should make a first class sand-clay surfacing. These analyses will serve to show the characteristics of typical roads which have been oil-treated on Long Island, and will be useful for comparison with sand-clay or top-soil roads in other localities where oiling is contemplated.

BROADCASTING THE SAND COVERING IMMEDIATELY AFTER APPLYING THE OIL

Method of Treatment

The road surface is first graded to a low crown with a road machine. The oil is then applied cold with a pressure distributor at the rate of ⅓- to 4/10-gallon per square yard. It is then covered uniformly with sand broadcast with shovels from piles along the side of the road. Only half of the road is treated at one time, and this is immediately covered. As soon as the covering is completed, traffic is allowed on the surface, and treatment is then given to the other side of the road. Within about two weeks the traffic irons down the surface and gives it the appearance of sheet asphalt. Dragging is sometimes resorted to several days after oiling, to aid in obtaining a smooth surface.

During the first year the common practice is to apply two treatments of oil. The following year sometimes one treatment is given and sometimes no treatment is necessary. Whenever the condition of the surface becomes uneven, blading is resorted to and the surface is brought back into shape. Every four or five years it becomes necessary to completely scarify and harrow the surface in order to bring it into first-class condition. Scarifying is done to a depth of 6 or 8 inches and the underlying soil is mixed to a considerable extent with the treated surface. The scarifying is not difficult, since even at the end of five years the oiled surface remains in a somewhat plastic condition. After scarifying and harrowing, a road machine is used for shaping the surface, and traffic is allowed to consolidate it. A fresh treatment of oil and cover material is then given in the manner followed on a new road.

APPEARANCE OF SURFACE A FEW DAYS AFTER TREATMENT
Traffic soon irons out the unevenness

The oil used on the roads inspected has the following characteristics:

Specific gravity, 25° C./25° C.	0.9587
Flash point (° C.)	58
Specific viscosity, Engler (25° C.)	109
Loss, 163° C., five hours (per cent)	24.39
Characteristics of residue, viscous liquid, slow flow	
Consistency of residue float test, 50° C. (seconds)	72
Total bitumen (soluble in carbon disulphide) per cent)	99.9
Organic matter insoluble (per cent)	.0
Inorganic matter insoluble (per cent)	.1
Per cent of total bitumen insoluble in 86° B. naptha	13.5

Nature of the Road Surface

When viewed from a moving automobile, the surface looks not unlike sheet asphalt, or in some cases like bitulithic when the original material contains large particles. The roadway is very readily cut with a knife, and the samples thus obtained seem very much softer than sheet asphalt. A heavy touring car creates slight cuts in it, and the tire markings are readily imprinted in the surface when the car moves slowly. In spite of the plastic nature of the surface, however, it does not seem to wave or shove and the shallow grooves formed by vehicles do not become deep, probably because of ironing out by traffic. The low crown on these roads is advantageous, as it undoubtedly encourages traffic to use the entire width of the roadway. Surfaces six years old have retained their plastic condition and it is probable that they can be maintained indefinitely with retreatments at proper intervals. Such surfaces might have an oiled depth, owing to the building-up process of scarifying and retreatment of 3 to 6 inches, although the average depth probably was not over 1½ or 2 inches on many of the roads inspected. The depth of treatment naturally depends on the length of time the roads have been under treatment.

Some of the roads carry a very heavy touring traffic. It is stated that in some cases the number of vehicles runs up to about 5,000 and 6,000 per day during the summer season. Several heavy trucks were also noted on sections of these roads.

It seems that this treatment offers an ideal solution of the dust problem on sand-clay and top-soil roads. Macadam, gravel, and shell roads have likewise been treated successfully by this method. The cost of maintenance is only slightly more than the average cost of maintenance of the ordinary earth road in Iowa and is less than the cost of maintaining gravel roads. The riding surface presented is superior to that of either of these types and is entirely free from dust. Wherever sand-clay or top-soil roads are used, oil treatments made in the manner described undoubtedly merit a thorough trial to determine whether or not they are advantageous under local conditions. It is stated that between 1,300 and 1,500 miles of roads on Long Island have now been oiled.

ANALYSIS OF SAMPLES OF LONG ISLAND OIL-TREATED SURFACE

	Sample No. 3 Per Cent	Sample No. 4 Per Cent
Bitumen extracted	8.3	7.2
Passing ¼-inch screen, retained on 10-mesh sieve	10.5	9.0
Passing 10-mesh sieve, retained on 20-mesh sieve	9.0	9.0
Passing 20-mesh sieve, retained on 30-mesh sieve	17.0	19.5
Passing 30-mesh sieve, retained on 40-mesh sieve	14.9	15.5
Passing 40-mesh sieve, retained on 50-mesh sieve	17.1	13.5
Passing 50-mesh sieve retained on 80-mesh sieve	11.5	9.5
Passing 80-mesh sieve, retained on 100-mesh sieve	3.0	12.5
Passing 100-mesh sieve, retained on 200-mesh sieve	3.5	3.5
Passing 200-mesh sieve	5.2	10.8

NOTE.—Sample No. 3.—Bayport, L. I., road 3 years old, three applications amounting to 1 gallon per square yard.

Sample No. 4.—Sample taken from road surface just after scarifying and before retreating.

ACKNOWLEDGMENT.—Text and illustrations by courtesy of *Public Roads*, U. S. Bureau of Public Roads, Department of Agriculture.

The Far Western Child Health Demonstration

MARION COUNTY, ORE., of which Salem is the county-seat, has been selected as the field of the Far Western Demonstration, the fourth in the Commonwealth Fund Child Health Demonstration Program. The selection was made by the Child Health Demonstration Committee, only after careful weighing of applications from more than 30 cities and counties in the 11 Pacific Coast and Rocky Mountain states which had made application to the Committee. Study of these applications and of the whole western health situation began in March, and has continued to the present time, the Committee considering not only the degree of need of child health work in the different local communities, but also the conditions and resources of each applicant community as a demonstration and educational center which should influence a wider territory.

The selection of Marion County assures the interest and cooperation of the state and county health and education leaders. Its population, estimated at 55,000 in 1924, is 90 per cent American-born. It is essentially rural, Salem, the state capital, having a population of 25,000. The county's varied crops—berries, nuts, hops, flax—and its developing dairying and canning interests, indicate a greater variety and stability of resources than in a one-crop or one-industry community.

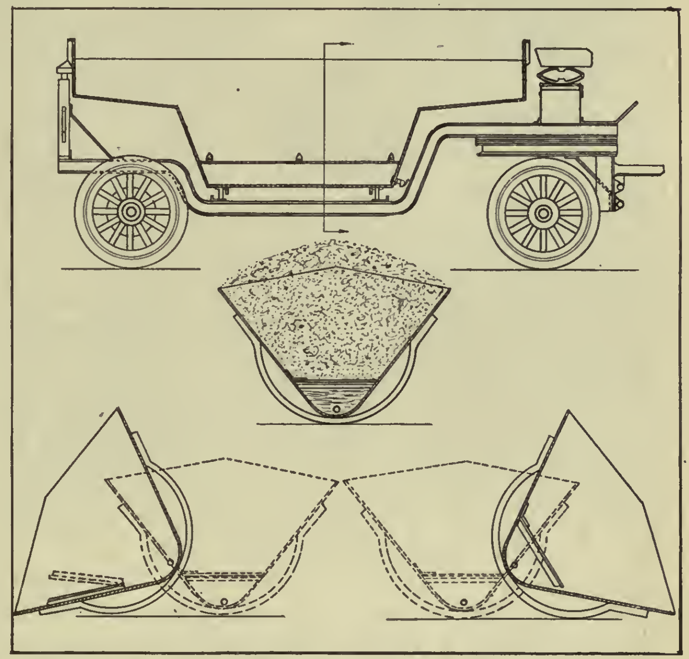
The Salem School Board has offered the Demonstration staff a conveniently located and completely equipped house for the Demonstration headquarters. Maintenance and up-keep are assured by the civic clubs of the city. The citizens of the county have pledged early establishment of a full-time county health unit, and their purpose is to increase the county's appropriations for child health each year, until, at the end of five years, they have taken over the responsibility, financial and administrative, for the complete program.

The entire program is under the Child Health Demonstration Committee, representing jointly the American Child Health Association and the Commonwealth Fund. The Committee's objective is the development of a sound community health program, beginning with the protection and promotion of child health, which the average community can carry on permanently. Such a program provides for health service beginning with the prenatal period and extending to adult life, and for all general health measures affecting directly or indirectly the health of the community's children. It aims not only to free the babies and children of to-day as far as possible from physical and mental handicaps, but to promote wholesome and constructive attitudes toward an efficient, far-visioned public health program and toward its intelligent support. In Marion County, it is the purpose to make this program give special consideration to western needs and conditions.

Dewatering Garbage During Collection and at Disposal Plant

A Better Garbage for Reduction and Incineration Produced by Dewatering

DURING 1923 the process of garbage reduction in Indianapolis underwent numerous important changes that have materially benefited operations. In cooperation with the collection department, a method was developed for dewatering the garbage in the trailers during collection. McCullough-Nolen dewatering devices have been installed in all the trailers used for the collection of garbage. During the heavy water season when a collector has filled his trailer about one-third full, he draws up over a convenient sewer manhole and drains the free water from the trailer. The same process is repeated when the trailer is about two-thirds full. The trailer is again drained when it has received its entire load and is ready for connecting in trains to be hauled to the plant. The dewatering device may be easily removed when not used in the cold winter months and when the vehicle is diverted to other uses.



DROP-FRAME TRAILER WITH PERFORATED PARTITION TO DRAIN GARBAGE

The dewatering device consists of a perforated load-sustaining plate placed in the trailer. The design of the device permits clean dumping of all of the solids in the vehicle as well as thorough cleansing of even the water-receiving compartment by washing after dumping. The garbage is dumped into the trailer from the individual household containers, and as the trailer bumps along over its route, the free water contained in the garbage is drained from the solids and settles into the water-receiving compartment in the bottom of the trailer. It will be noted that the shaking is done after each small lot of garbage is dumped into the trailer, thereby giving the garbage every opportunity to rid itself of its free water content at once.

Instances have been noted where more than 150 gallons of water have been drained from a single trailer from the time the collection starts until the garbage is ready for dumping into the pit at the reduction plant. The principal advantages of dewatering are: (1) the garbage is in better condition for cooking at the plant; (2) it eliminates a large part of the odors about the plant; (3) better garbage produces better products; (4) better products bring greater financial returns; (5) it eliminates some of the hazards of garbage reduction; (6) it increases the capacity of the plant by eliminating raw material that gives little or no return in product; (7) it separates the free water from garbage during collection; (8) it lowers collection costs; (9) it lowers reduction costs; (10) it lowers incineration costs because dryer products are fed to the fires for burning; (11) it reduces the hazards of feeding raw garbage; (12) it decreases the collection and disposal plant labor turnover; (13) it permits hauling bigger loads in some cases over 50 per cent bigger; (14) it protects the public health by eliminating odor and fly nuisances due to spilling garbage liquor on the streets; (15) it reduces criticism

DROP-FRAME TRAILER EQUIPPED WITH DRAINAGE DEVICE
Liquid being drained from wagon over sewer manhole

against the collection system; (16) it simplifies the collection system.

An arrangement whereby the garbage pit at the plant may be drained was installed soon after the dewatering devices were put in the trailers. The results obtained from installing the facilities for dewatering green garbage have been remarkable from an operating standpoint. The green garbage after being dewatered remains fresh and in good condition for cooking, for a much longer time than when not dewatered. The difficulty of handling it is less and the cooking results superior. It has been found that the water drained from the green garbage does not carry a sufficient quantity of solid matter to warrant the expense of collecting and treating it. With the free water eliminated, it has been found that the tankage yield from the digestors is greater per charge. The cooking results are better, the tankage of a better quality, and the difficulties of processing are greatly reduced. The success of drying and grease-recovery operations are dependent upon the cooking results obtained in the digestors. Since the dewatering campaign was inaugurated, the recovery of grease has been greater and less expensive. There are also certain operating hazards in processing garbage. Among these is the foaming of the digestors during the cooking period. Dewatering has practically eliminated foaming, with its attendant high tank pressure that often exceeded the live steam pressure in the boilers. It has also gone far toward eliminating the odors of the garbage pits and plant.

For several years it has been usual to operate a night shift at the reduction plant during the summer. During the last year the night shift has been eliminated, principally on account of the development of the dewatering devices.

The results of the improvements that have been made are shown by the fact that although 1,059 tons less green garbage was received at the plant during the last complete fiscal year, the total grease production was increased 55,200 pounds.

Cincinnati Adopts P. R. Manager Government

FOLLOWING the lead of Cleveland, Cincinnati voted on November 4 by more than two to one to abolish its mayor and ward council plan of government and to adopt the city manager plan with proportional representation.

Some months ago Dr. Lent D. Upson, of the Detroit Bureau of Municipal Research, was engaged to conduct a thorough survey of the city government of Cincinnati and recommend any changes needed. After a very thorough investigation with a staff of trained assistants, Dr. Upson recommended non-partisan elections, a smaller council, and provision for the representation of minorities. Professor Thomas H. Reed of the University of Michigan, special investigator of the city council, reported: "Since the lack of an active opposition, more than anything else, has tended to degenerate the government of Cincinnati, we felt called upon to urge the use of some method of choice which will give us the advantage of election at large, together with a reasonable representation of minorities. This can be done most fairly by proportional representation. Under this system each group of opinion which can muster one-ninth of the total vote may be represented in a council of nine."

The amendment which has just been passed puts into effect the most important recommendations of the experts who made the survey. It reduces the council from 32 members to 9, provides for its election from the city at large on a non-partisan ballot by proportional representation, and gives the representative council complete control over the city government by allowing it to employ, supervise, and, if necessary, replace the city's chief executive. The first proportional election will be held next fall at the time of Cleveland's second election under the same method.

Does Street Flushing Fill Up Catch-Basins?

A Discussion of Experiments Made in Philadelphia in August, 1924

By A. M. Soby and J. H. Nuttall

Deputy Chief and Assistant Engineer, respectively, Division of Street Cleaning, Philadelphia

FLUSHER USED IN TESTS, SHOWING PRESSURE GAGE ON SINGLE NOZZLE USED

CLEANING by motor-driven flushers has in recent years been increasingly regarded as the most economical and efficient method of cleaning streets. The principal factor that has served to render the flusher most desirable has been the increased yardage of modern smooth-surface streets in our cities, and it is on these streets that the flusher is principally used.

Ideal cleaning can best be obtained by the use of high-pressure hose followed by laborers with hand brooms and hand squeegees, but this type of cleaning is extremely expensive and wasteful of water. The rotary squeegee machine performs excellent cleaning with a minimum of water on streets of a perfectly smooth surface, but it is expensive to operate and inefficient on streets with even slight depressions. The flusher combines most of the advantages of both these types of cleaning and is open to few of the disadvantages.

There has been considerable objection, however, to the use of the flusher, because of the alleged washing of dirt into the catch-basins or inlets and thence into the sewer. Where trapped inlets are in use, as is the case in practically all of our cities, it is scarcely possible for material in large quantities to enter the sewer from the inlets excepting in the case of a heavy storm, and in this event any material washed into the sewer is usually carried to the outlet by reason of the heavy flow. During normal rainfall, such material as enters the sewer is sufficiently small in size to be held in suspension and is consequently carried to the sewer outlet with the normal dry-weather flow of the sewer, particularly where the combined system is in use.

The case of dirt being deposited by cleaning methods in the inlet and collected from the catch-basin is another matter, as the problem then arises as to whether it is cheaper and more desirable to collect the dirt from the catch-basin or to sweep and collect it from the gutter. As there appear to be no reliable data on the amount of material flushed into inlets, tests were made by this Division in order to secure definite information on the subject.

Plans for Tests

A test of this character should necessarily stimulate normal conditions, but with determinable quantities and sizes of material for comparison purposes. It should also be made on streets with ideal surfaces and with known longitudinal and cross-grades. As the amount of dirt collected from streets of this character during ordinary cleaning operations is of so small an amount per square yard as to be impossible of determination, excepting by laboratory methods, it is necessary to use a quantity much greater than would normally be found on the streets, and the material used should be uniform for all tests and of known size and weight.

To meet these conditions, it was decided to utilize streets within an area of three by two blocks in the northern West Philadelphia section. The streets used had all been recently paved with sheet asphalt, and were in excellent condition, with 22½-inch vitrified block gutters, with uniform cross-grades of 5/16-inch per foot, and with longitudinal grades of 1, 2, 3, 4 and 5 per cent respectively.

The material used as a substitute for natural conditions, other than those behind the ash routes, was of two kinds: one being a paving gravel, the other a sandy loam, mechanical analyses of which are as follows:

Passing Screen	Paving Gravel	Sandy Loam
100	1.4	14.3
50	11.3	11.5
30	43.0	23.0
16	21.8	23.2
8	14.7	19.3
4	5.8	4.6
Returned on 4	2.0	4.1
	100.0	100.0
Weight cubic feet	93.9 lbs.	90.7 lbs

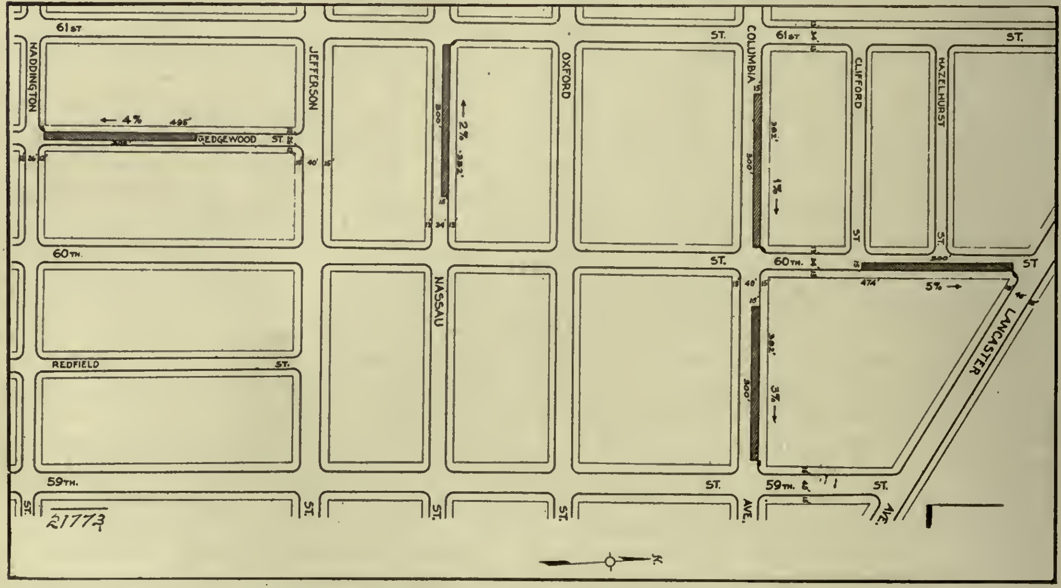
In addition to the foregoing, a test was made with cans and newspapers, to correspond to conditions found by the cleaning gangs following the ash and rubbish collection.

In tests using gravel and loam, the material was scattered by hand upon an area 15 feet wide x 300 feet long, containing 500 square yards, to a uniform weight of ½-pound per square yard on each street, after the pavement had been thoroughly flushed and the gutters swept. This area was divided into sections of 25 feet each, numbered 1 to 12 from the inlet. A screen fabricated from ½-inch round steel, 8 inches high x 7 feet long and bent at 45° 3 feet from end, covered with burlap, was placed at the inlet in order to prevent the entrance of material, which was considered a more practical method than cleaning out the catch-basin and removing the dirt afterwards from the inlet, as it would in this case have been necessary to bale out the water before the material within could have been removed.

Flushing Equipment

The Division possesses 26 flushers, 3 of which are Packards, single-unit, transmission pump drive of 1,750-gallon capacity; 15 are single-unit, front-drive Packards, 1,500-gallon capacity; 6 are single-unit, front pump drive Macks, 1,500-gallon capacity; and 2 are double-unit, 1,500-gallon capacity Macks. It was considered advisable in all tests to use a flusher as near the average as possible, rather than the best or the worst, and to this end Packard Number 21, a single-unit, front pump drive flusher was adopted. No change was made in the flusher excepting that it was equipped with a pressure gage on the nozzle as well as on the dash. A mechanic who had formerly had considerable experience in driving a flusher was used as chauffeur on all tests. The nozzle was set with opening as follows: 7⅛ inches at front and 7⅜ inches at back above street, the front end of opening being 4½ inches behind back end, and the length of opening 7⅛ inches.

In conducting the tests the flusher was operated with the nozzle on a line 15 feet distant from the curb, and the speed was kept as



MAP OF STREETS UTILIZED IN PHILADELPHIA FLUSHER EXPERIMENT

TABLE "A"

Test	Sq. Yds.	Grade %	+Up —Down	Material	Lbs.	Flushing Time in Seconds	Speed M.P.H.	Gals. Water	Pressure Lbs.	Gear	Time Water Run-off	Time Mat. Dried	Weight of Material (Lbs		
													At Inlet	In Gutter	Total
1A	500	1	—	Paving Gravel	250	90	2.3	198	45	1	20 min.	1½ hr.	11	239	250
1B	500	1	+	Paving Gravel	250	88	2.3	195	45	1	16 "	1½ "	10	240	250
1C	500	1	—	Loam	250	82	2.5	185	45	1	18 "	1½ "	60	190	250
2A	500	2	—	Paving Gravel	250	82	2.5	185	45	1	14 "	2 "	15	235	250
2B	500	2	+	Paving Gravel	250	89	2.3	196	40	1	14 "	1½ "	15	235	250
2C	500	2	—	Loam	250	82	2.5	185	45	1	16 "	1½ "	90	160	250
3A	500	3	—	Paving Gravel	250	79	2.7	165	45	1 & 2	16 "	2 "	17	233	250
3B	500	3	+	Paving Gravel	250	89	2.3	195	45	1	12 "	2 "	52	198	250
3C	500	3	—	Loam	250	83	2.5	185	45	1	13 "	1½ "	112	138	250
4A	500	4	—	Paving Gravel	250	79	2.6	175	45	1	13 "	1½ "	35	215	250
4B	500	4	+	Paving Gravel	250	90	2.3	198	40	1	19 "	1½ "	64	186	250
4C	500	4	—	Loam	250	79	2.6	175	45	1	19 "	1 "	123	127	250
5A	500	5	—	Gravel	250	84	2.4	185	45	1	10 "	2½ "	54	196	250
5B	500	5	+	Gravel	250	88	2.3	198	45	1	16 "	1 "	91	159	250
5C	500	5	—	Loam	250	85	2.4	187	45	1	12 "	1 "	130	120	250

NOTE—Tests 1A B & C were made on Columbia Ave. between 60th & 61st Sts. Tests 2A B & C were made on Nassau St. between 60th & 61st Sts. Tests 3A B & C were made on Columbia Ave. between 59th & 60th Sts. Tests 4A B & C were made on Edgewood St. between Jefferson & Haddington. Tests 5A B & C were made on 60th St. between Columbia & Lancaster.

TABLE "B"—FLUSHER TEST DATA TABULATION SHOWING WEIGHTS OF MATERIAL

Test	Material	Lbs. Placed	At Inlet	Sec. 1	2	3	4	5	6	7	8	9	10	11	12	Total
1A	Paving gravel....................	250	11	6	19	16	18	23	25	15	18	26	26	25	22	250
1B	Paving gravel....................	250	10	17	17	17	16	12	12	12	20	28	35	24	30	250
1C	Loam..........................	250	*60	28	20	22	15	16	16	14	15	16	10	10	8	250
			*Includes 20 lbs. in suspension													
2A	Paving gravel....................	250	15	4	30	23	17	30	26	21	27	24	15	11	7	250
2B	Paving gravel....................	250	15	5	40	12	18	28	26	21	27	25	13	12	8	250
2C	Loam..........................	250	*90	13	15	8	8	22	16	8	16	16	14	16	8	250
			*Includes 28 lbs. in suspension													
3A	Paving gravel....................	250	17	5	25	24	24	24	25	21	25	19	17	12	12	250
3B	Paving gravel....................	250	52	10	13	20	12	30	22	8	16	18	24	15	10	250
3C	Loam..........................	250	*112	8	10	12	19	14	14	11	13	13	9	9	6	250
			*Includes 43 lbs. in suspension													
4A	Paving gravel....................	250	35	15	13	15	20	14	18	22	22	20	20	22	14	250
4B	Paving gravel....................	250	64	10	8	24	10	10	12	32	20	16	8	28	8	250
4C	Loam..........................	250	*123	5	6	9	8	8	15	14	14	16	9	16	7	250
			*Includes 58 lbs. in suspension													
5A	Paving gravel....................	250	54	11	12	13	10	14	13	13	20	20	24	36	10	250
5B	Paving gravel....................	250	91	29	18	39	8	5	5	6	6	5	5	22	11	250
5C	Loam..........................	250	*130	15	10	10	10	5	10	10	15	10	10	10	5	250
			*Includes 70 lbs. in suspension													

nearly as possible to 2.5 miles per hour, being determined by the actual length of time required by the flusher to travel 300 feet, as this was considered more accurate than reading the speedometer. This was done once with the paving gravel and once with the loam, the flusher operating down hill, and once operating up hill with the gravel only, as it was not considered necessary to use the loam also in this case. The results obtained in these tests are shown in tables "A" and "B." Table "A" shows the various details of operation and Table "B" shows the distribution of material in the gutter, into which all material was washed by the flusher, none remaining outside the 22½-inch width of gutter. For convenience in visualizing these results, a graph, "C," was prepared and is reproduced on the following page.

Analysis of Tests

Upon being analyzed, the test shows that it is possible to flush a far greater amount of dirt than is normally found upon any smooth street in a residence neighborhood into the gutter from a distance of 15 feet from the flusher nozzle, and that, once in the gutter, the amount of material carried to the inlet is dependent upon the grade of the street and the volume of water in the gutter.

From table "B" it will be noted that there is little uniformity in the amount of dirt deposited on the various sections, this being due to the irregularity in the gutter more than to any other factor.

In order to simulate cleaning conditions behind the ash and rubbish route, newspapers and cans were placed alternating at a distance of 12½ feet apart, a distance of 15 feet from the curb. The flusher was then operated down hill as before, and the number of papers and cans reaching the gutter, and those which would have been deposited in the inlet, were it not for the screen, were noted, with the results shown in table "D." Considering the variation in the material used from that of the previous tests, the correspondence in results because of grades is remarkable.

TABLE "D"—SPECIAL FLUSHER TEST DATA

				Speed	Flusher	Gals.	Location of Material after Flushing	
Test	Sq. Yds.	Material	No. Placed	M. P. H.	Time	Water	In Inlet	In Gutter
1 1%	500	Newspapers & Cans	12 each	2.5	52 sec.	185	0	12 papers & 12 cans
2 2%	500	“ “ “	12 “	2.4	85 “	185	5 papers 2 cans	7 “ “ 10 “
3 3%	500	“ “ “	12 “	2.5	83 “	185	7 papers 1 can	5 “ “ 11 “
4 4%	500	“ “ “	12 “	2.5	83 “	185	11 papers 4 cans	1 “ “ 8 “
5 5%	500	“ “ “	12 “	2.4	85 “	185	12 papers 4 cans	8 “

Placed 15′ from curb—25′ apart

Test No. 1—Columbia Ave. between 60th & 61st Sts. Test No. 2—Nassau St. between 60th & 61st Sts. Test No. 3—Columbia Ave. between 59th & 60th Sts. Test No. 4—Edgewood St. between Jefferson & Haddington. Test No. 5—60th St. between Columbia & Lancaster.

The tests show that where any considerable amount of material is present upon streets cleaned by flushing, the water will deliver an appreciable amount of material at the inlet, but as the normal amount of dirt produced in two days in this section, excepting behind the ash route, is .049 pounds per square yard, it will be seen that it is desirable to flush this small amount of material into the inlet and remove it thence rather than to sweep the gutter for such a small quantity.

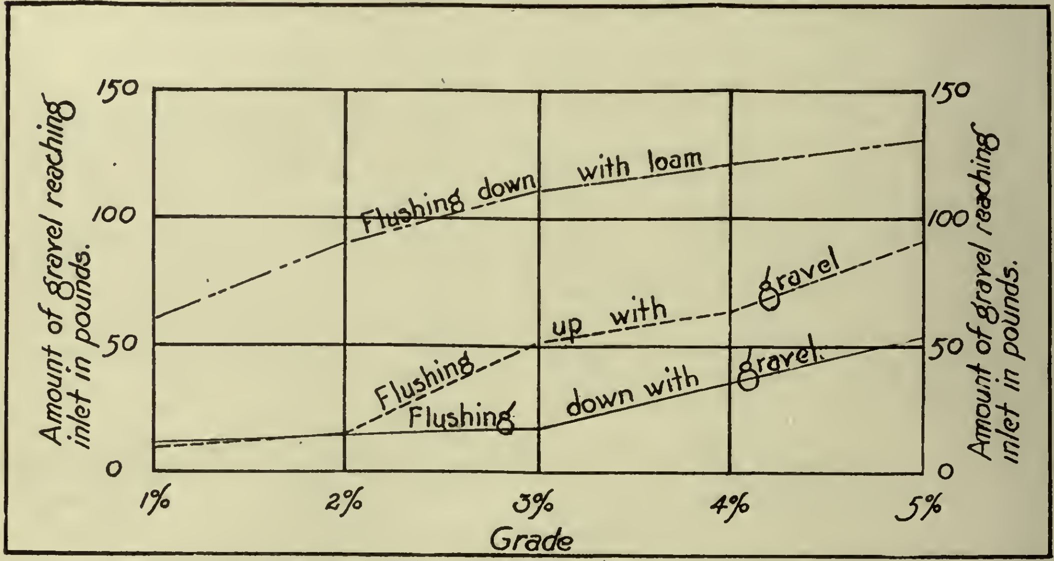
It it were possible to actually determine the amount of material upon a street prior to flushing, tests similar to the foregoing would be unnecessary, but as this is not possible, an idea of the amount of material reaching an inlet under normal conditions can be gained only by utilizing information as secured above, and correcting it to normal conditions over larger areas.

Catch-basins, or inlets, in the city of Philadelphia are all trapped, are constructed of brick, lined with flags, are of either the open-mouth or the grate-top type, as necessitated by local conditions, and are in four sizes numbered 1, 2, 3, 4, beginning with the largest. The number 4 size is rarely used, and the number 1 and number 2 sizes are used on heavy grades or at the end of a considerable length of gutter. The catch-basins are of such capacity that it would require 15.8 cubic feet, 12.4 cubic feet, and 9.0 cubic feet of dirt to entirely stop the flow of water to the sewer in the 1, 2 and 3 sizes respectively.

In accommodating the information obtained in the tests to normal conditions, the test with the paving gravel will be utilized, as much of the material contained in the loam was carried in suspension into the sewer.

Table "A" shows that the amount of material reaching the inlet is proportional to the whole amount of material in the test section as follows:

1 per cent grade	.044
2 per cent grade	.060
3 per cent grade	.068
4 per cent grade	.140
5 per cent grade	.216



GRAPH "C," SHOWING EFFECT OF GRADE ON AMOUNT OF MATERIAL FLUSHED INTO SEWER INLET

The quantity of dirt obtained by three-times-per-week cleaning per square yard was given above as .049 pounds, and this figure was obtained by actually weighing the amount of dirt removed from a section of 190,000 square yards. In a section of this character an inlet will usually be found on each side of a street at intervals of 500 feet or less, and if the average width of street is taken as 30 feet, the paving area discharging into the inlet would then be 500 x 15 feet, or 833 square yards, and the normal amount of dirt accumulating in this section in 2 days would be 40.8 pounds.

In utilizing the above percentages, it will be seen that on this basis the amount of dirt that would be flushed into the inlet on the different grades if cleaning proceeded every other day, would be as follows:

Grade	Amt. Reaching Inlet (2 Days) Pounds	Cu. Ft. (2 Days)	Days to Fill Inlet 1	2	3
1 per cent	1.79	.020	158	124	90
2 per cent	2.45	.027	116	92	66
3 per cent	2.77	.031	102	80	58
4 per cent	5.71	.063	50	40	28
5 per cent	8.81	.098	32	26	18

Estimated at 90 pounds per cubic foot.

From this it will be seen that the amount of dirt flushed into the inlet in a residential section even on heavy grades is inconsiderable.

In the discussion above, results obtained with gravel were considered, but if the loam were utilized, there would be a considerable variation, for although a greater proportion of material reaches the inlet, a considerable amount is carried in suspension, as is shown by the following tabulation:

LOAM TESTS

Grade	Total Lbs.	Suspensions Lbs.	Per Cent Total
1 per cent	60	20	33
2 per cent	90	28	31
3 per cent	112	43	38
4 per cent	123	58	47
5 per cent	130	70	54

While it is not practical to fix a definite relation between the amount of dirt flushed from the street and that reaching the inlet except by the above method, a test was made of dirt flushed to the inlet from 10,200 square yards of paving on a street carrying somewhat heavier traffic and producing slightly more dirt than in the section above, but flushed daily, which amounted to 10.88 pounds, or .069 pounds per 833 square yards, which is almost exactly that obtained per day by utilizing data obtained in the test.

Conclusion

It is apparent that any dirt which is on our streets in sufficiently small quantities to be removable by water only, is so small in size as to be carried by any amount of water used into and through the sewer in suspension; that heavy dirt on all excepting very heavy grades remains in the gutter; and that any material reaching the inlet is readily removable. This is particularly true in Philadelphia, because of the total area of streets flushed, only a very small proportion is on grades of over 2 per cent, as is shown by the following tabulation:

Grade	Proportion of Total Area
Less than 1 per cent	44 per cent
1 to 2 per cent	38 per cent
2 to 3 per cent	11 per cent
3 to 4 per cent	4 per cent
Over 4 per cent	3 per cent

Niagara Frontier Planning Association Organized

LOOKING toward the creation of the first official regional planning body in New York State, official delegates of all municipalities of Erie and Niagara Counties, at a meeting held at Tonawanda on November 17, organized the Niagara Frontier Planning Association.

This volunteer association will promote regional planning for the future development and growth of that territory extending from the Niagara River between Lake Erie and Lackawanna westward to include the cities of Lockport, Niagara Falls, North Tonawanda, Tonawanda, Buffalo, and Lackawanna, also twenty-two villages, some lying along the river and lake region and others bordering upon a rapidly developing metropolitan area extending beyond the borders of the various cities.

Pursuant to a resolution adopted at the organization meeting, the Association will endeavor to secure the passage of legislation authorizing the creation of a Niagara Frontier Planning Committee, which will be an official body of thirteen members, composed of the mayors of the six cities of the Niagara Frontier, or persons designated by them, and six supervisors appointed by the Board of Supervisors of the counties of Niagara and Erie, these twelve to meet and select the thirteenth member, who shall act as chairman. It is proposed that this committee shall maintain a technical staff and make detailed surveys and studies of a comprehensive plan for the Niagara Frontier and that the committee shall be financed by the two counties pro rata on the basis of their equalized assessed valuations.

The organization of the Niagara Frontier Planning Association was first proposed at a meeting called by the New York State Commission of Housing and Regional Planning in Buffalo on June 10 last. The officers elected by the Board of Directors on November 17 are as follows: President, Alexander J. Porter, of Niagara Falls; First Vice-President, J. Fred Moore, of Tonawanda; Second Vice-President, Nathaniel Foster, of Lockport; Treasurer, Henry P. Smith, of North Tonawanda; Secretary, H. A. Chapin, of Tonawanda. The Association will maintain an office in Tonawanda, with a small paid staff.

Wear of Concrete Pavements Tested

Report of Accelerated Tests by United States Bureau of Public Roads

By F. H. Jackson and J. T. Pauls

Senior Assistant Testing Engineer and Highway Engineer, respectively, United States Bureau of Public Roads

THE accelerated-wear tests of concrete pavements conducted by the Bureau of Public Roads, at Arlington, Va., during the past 18 months, have reached the stage where it is possible to draw fairly definite conclusions from the data so far obtained. The sixty-two concrete test sections, each 4 feet wide by about 10 feet long, and constructed in the form of a circle approximately 625 feet in circumference, have been subjected to approximately 300,000 passages of a solid-rubber-tired truck wheel loaded to 3,000 pounds and traveling around the circle over the same path at a speed of 22 miles per hour. Careful observations of the lateral distribution of traffic across actual pavements indicate that about 10 per cent of the total passes over a 6-inch width at the point of greatest concentration. This is based on traffic passing in two directions over an 18-foot road. On this basis it is estimated that the experimental pavement sections have been subjected to a traffic equivalent to about 1,500,000 2-ton trucks operating at a speed of 22 miles per hour, assuming the distribution indicated by the above observations. In addition, the test sections have been subjected to about 50,000 passages of a rubber-tired wheel loaded with the same weight and equipped with non-skid chains, and the same number of passages of a plain rubber-tired wheel. The wheels in this part of the test traveled over a new path. It will be seen, therefore, that the equivalent of an enormous volume of traffic has been put upon the pavement—an amount probably equivalent to several years' traffic on the average concrete road.

It was, of course, impossible to reproduce on the test sections in the short space of a year and a half the effect of freezing and thawing which, through a period of years, may weaken actual roads so that they become less resistant to traffic. It was likewise impossible to reproduce the effect of differential expansion and contraction of the thin, rich mortar top and the mass of the concrete, which, caused by wide variations in temperature, may also, in time, lower the resistance of a pavement. The essential time element is lacking. In these respects, therefore, the test did not duplicate actual conditions, and for this reason the differences in the behavior of the several sections under examination may not be so marked as they normally would have been.

The primary object of the test was to determine what relations, if any, exist between the surface behavior of concrete roads under traffic and the various laboratory tests for quality of the aggregates. Incidentally it was also deemed desirable to determine the relation between the wear as produced by traffic, as well as by laboratory test, and the various physical properties of the concrete, such as crushing strength, transverse strength, modulus of elasticity, and absorption. All of these tests were made on the concrete used in each of the 62 test sections.

Specifications for aggregates for concrete pavements are usually drawn to cover the gradation and the quality of the material furnished. The gradation, or proportion of the various sizes, especially as regards aggregates which are crushed and screened, depends largely on factors which can be controlled, so that the engineer may obtain almost any desired gradation of sizes, provided he is willing to insist upon it. The quality of the material, however, cannot be fixed in so arbitrary a fashion. On account of the high cost of transportation, the aggregates for any given improvement must generally be found within a relatively short distance of the site of the work. Therefore, as the quality and character of materials vary so greatly in different parts of the country, it follows that many different kinds and types of aggregates must be employed in the construction of concrete roads. All that can be done is to draw specifications in such a way as to insure the use of the best material available for the work. In so doing, however, there is always a minimum limit beyond which it is unsafe to go.

What are the safe test limits for the various kinds of aggregates used in concrete road construction? Do the present limits for wear, strength, etc., insure the selection of safe materials, or, on the other hand, do they unduly add to the cost of construction by setting laboratory requirements too high? These are some of the questions which the accelerated-wear tests were designed to answer.

The detailed conclusions which it has been possible to draw from the test are set forth fully at the end of this article. Outstanding from these conclusions are two facts of major importance. These are:

1. That rubber-tired traffic alone does not appreciably abrade the surface of a concrete pavement.

2. That there is no consistent relation between the results of the "tensile-strength-ratio" test for sand, the compression or transverse strength tests, or the Talbot-Jones wear tests of concrete, and the wear-resisting properties of concrete pavements.

The sections were divided for purposes of study into five major groups, as shown in table 2. The source, character, and physical characteristics of the various coarse aggregates are given in table 3, and the corresponding information for the fine aggregate in table 4. The sections in group I were constructed with the purpose of studying the effect of variations in quality of crushed stone as coarse aggregate. Ten samples of stone varying in quality from hard, tough traps to very soft limestones were used for this purpose. In group II the effect of variations in the quality of gravel as a coarse aggregate was investigated, and for this purpose nine samples of gravel from various parts of the country were obtained. Group III comprised eight sections and was for the purpose of studying the behavior of slag as concrete road aggregate. Both the size and quality of the slag as well as the effect of slag sand used as fine aggregate were studied. Four sections were constructed with blast-furnace slag, three of them using slag weighing approximately 75 pounds per cubic foot, and one using slag weighing 56 pounds per cubic foot. Copper and lead smelter slags were used in the other three sections in this group. Group IV was composed of seven sections in which the type of sand was the object of study. The sands used ranged from a very coarse, glacial sand from Wisconsin to a fine, pure quartz sand from South Carolina. Strength ratios varied from 126 to 70 per cent and the fineness moduli from 2.2 to 3.5. The sections in group V were constructed with the idea of noting the effect of various miscellaneous factors on the surface wear, such as consistency of the concrete, the time of mixing, proportions or cement content, grading of aggregates, and the effect of hydrated lime as an admixture. In addition, sections were constructed using mine chats from Joplin, Mo., and burnt clay as coarse aggregates, and limestone screenings in place of sand as fine aggregates. Finally, two sections were built without coarse aggregate, one in the proportion of 1:1½ and the other a 1:3 mortar.

Some of the Conclusions

"That gravel concrete, in general, is at least as satisfactory from the standpoint of wear as stone concrete."

"That small amounts of shale occurring in the coarse aggregate will cause both excessive and uneven wear."

"That slag or stone screenings are, in general, unsatisfactory as substitutes for natural sand as fine aggregates in concrete road construction."

"That coarse sands, other things being equal, show greater resistance to wear than fine sands."

"That unusual precautions should be taken in using mine chats or other similar harsh-working materials."

Effect of Quality of Gravel

In this group are nine sections in which various types of gravel were used. The most noticeable fact about this group is that, although a very wide range in quality of gravel is represented, in no case was the depth of wear so great as in five of the sections in group I. When tested by the Rea* abrasion test, the gravel samples ranged from 9.3 per cent to 29 per cent loss. Several of the samples consisted of pieces too small to make the abrasion test. Section 17 is a remarkable one.* Although the South Carolina quartz gravel used in this section showed a percentage of wear of 29 (which is roughly equal to about 10 in the Deval abrasion test), the depth of wear is but little above the average for all the gravel sections and is not so great as in many of the stone sections. A close examination of this gravel shows that it is made up entirely of quartz pebbles of varying hardness, on the inside, but all protected by a hard, exterior shell. A pebble when struck even a light blow will fly to bits, yet it is very difficult to scratch the surface with a knife. Apparently the quality of hardness was more important than toughness in resisting surface wear on these test sections, which leads to the conclusion that the modified Deval test for gravel may be too severe. Because of the presence of the large shot in the rattler, it is distinctly a test for toughness. The worst gravel from the standpoint of depth of wear is the one in section 19. This gravel contained about 5 per cent of shale particles and was submitted as an example of an aggregate of doubtful quality.

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* U. S. Department of Agriculture Bulletin 949, p. 8.

While the gravel sections appear to advantage in comparison with the stone sections from the standpoint of depth of wear, comparison as to uniformity of wear is not favorable to them. Sections 15 and 16, both containing glacial gravels, show up best in this respect. It is an interesting fact in this connection that the four sections in which limestone is a constituent material of the gravel are the poorest as regards uniformity of wear. In sections 13 and 14, the gravels contain quite an appreciable amount of soft sandstone pebbles which have been worn away by the action of the chains, leaving marked depressions in the surface. On the other hand, the mere fact that the fragments are smooth and rounded appears to make little difference as far as wear is concerned. Section 18 is a good example. Before the chain traffic was well under way, the prediction was freely made that the smooth, rounded pebbles composing this sample would speedily kick out. As a matter of fact, this is one of the best of the gravel sections, especially as regards depth of wear. Summing up, it would appear from these tests that gravel as a class should prove as satisfactory for aggregate in concrete as crushed stone, provided it is free from an excess of soft or disintegrated pebbles. Moreover, the mere fact that the particles lack toughness is no drawback provided they are sufficiently hard to resist abrasion.

Quality of Sand

In sections 20 to 26, inclusive, as well as section 50, variations in wear, due to both quality and grading of natural sand as fine aggregates, were studied. Sands were selected for this purpose varying in strength ratio from 126 per cent to 70 per cent of standard Ottawa sand and from 2.2 to 3.5 in fineness modulus. Of this group, section 22, in which a river sand from Fayette County, Pennsylvania, was used, developed the greatest depth of wear, a little over 0.4 inch. This sand contained an appreciable amount of carbonaceous shale, which probably accounts for the increased wear. It was also a rather fine sand, only 25 per cent being retained on the No. 20 sieve. The next greatest wear took place on section 50, which contained the fine Potomac River sand. Only 9 per cent of this sand was coarser than a No. 20 sieve, and the strength ratio at 28 days was only 84 per cent. Four of the test sections, Nos. 21, 14, 25, and 26, all showed about the same resistance to wear, about 0.3 inch. With the exception of No. 24, all of these may be classed as coarse sands, that is, they contain more than 30 per cent of particles coarser than No. 20 mesh. The sand in No. 24, which was from South Carolina, though considerably finer, with only 17 per cent on the 20-mesh sieve, was of exceptionally good quality, being composed entirely of pure quartz grains. A comparison of this sand with that used in section 22 is of interest because they have approximately the same grading, indicating that the variation in wear is probably due to the difference in the quality of the material. Section 20, Potomac River sand, and section 23, containing a glacial sand from Marathon County, Wisconsin, showed the smallest amount of wear. Both of these would be classed as coarse concrete sands.

The tests in general indicate the value of the coarse particles in reducing wear. For example, compare sections 20 and 50, in which Potomac River sand was used. The materials in these sections were identical except that the sand in section 50 was finer, the proportion of particles retained on the 20-mesh sieve being reduced from 40 per cent to 9 per cent. The effect on wear is quite marked.

When we come to consider the bearing which the strength-ratio test has on the pavement wear, we have difficulty in establishing any relation. The wide range in briquette strength is not reflected in the resultant wear, any more than in the concrete strength of the materials. This is probably due to the fact that the factors which influence the strength, i.e., gradation and quality of sand grains, do not affect the surface wear to the same degree. For instance, the mortar-strength test is made on a 1 to 3 mix and compared with an Ottawa sand mortar in the same proportion, whereas the cement-to-sand ratio in the test sections was 1 to 1½. The discrepancy in results, in so far as this test is concerned, is most marked in the case of section 21, in which a glacial sand from New Hampshire, containing quite an appreciable percentage of feldspar, was used. A strength test of this sand developed only 70 per cent of the strength of Ottawa sand in spite of the fact that the sand was very coarsely graded. Although this section has worn somewhat more than the Potomac River sand sections, the difference is not nearly so great as might be supposed from the results of the mortar strength test. It would seem, therefore, that the strength-ratio test is of questionable value as an indication of the quality of sand for concrete pavement work, at least in so far as resistance to wear is concerned.

The tests in group V*b* in general indicate that variations in gradation of aggregates within the limits tried do not affect the wear to any great extent, other things being equal. It must be realized, however, that from the standpoint of uniformity in workability and consequently in strength, it is very important to have uniformly graded material in a concrete road job. A harsh-working mix due to poorly graded aggregate almost invariably results in poor concrete in the field. If an attempt is made to place the concrete at proper consistency, it is very hard to secure a satisfactory finish. If, on the other hand, sufficient water is added to make the mix workable, concrete greatly deficient in strength will result. The answer is to have the mix of such workability that it can be placed and finished without using excess water, and the authors believe that this can best be accomplished by having uniformly graded aggregates. This point is discussed here simply to emphasize a condition which is met with in practice, but which the tests did not cover, because, as has been stated, the concretes in all of these sections were of medium consistency, and not necessarily all of the same workability. These tests indicate what would probably result in practice provided the consistency were rigidly controlled irrespective of the harshness of the concrete mix.

Conclusions

Before attempting to draw general conclusions from these tests, it may be well to restate certain premises regarding the volume and character of traffic to which the test pavement has been subjected. These premises follow:

1. That on the average 18-foot concrete road, approximately 10 per cent of the total traffic moving in both directions passes over a band 6 inches in width at the point of maximum concentration. Therefore, the traffic passing over the test road should be multiplied by at least 10 to obtain the equivalent volume of traffic on an actual pavement.

2. That the comparative resistance of each test section to the surface wear produced by the tire chains is an indication of the comparative resistance which would be offered by the concrete to wear or disintegration at the edges of exposed joints and cracks under service conditions.

3. That conditions which cause surface wear, such as steel tires, tire chains tracking through snow, etc., are present to such an extent as to make it necessary to give the question of wear consideration in the selection of concrete aggregates.

The authors believe that the data so far secured warrant the following conclusions:

1. That the rate of wear of stone concrete is, in general, not affected by the coarse aggregate, provided the coarse aggregate is equal or superior to the mortar matrix in resistance to wear.

2. That excessive wear will result from the use of very soft stone as coarse aggregate even though used in conjunction with a mortar of satisfactory quality. From the results of these comparative tests, it would appear that stone with a percentage of wear over 7 should not be used in concrete road construction.

3. That gravel concrete, in general, is at least as satisfactory from the standpoint of wear as stone concrete.

4. That gravels consisting essentially of siliceous materials are superior as regards both the amount and the uniformity of wear to those containing a preponderance of calcareous fragments.

5. That gravels consisting of rounded particles are as satisfactory from the standpoint of wear as those consisting either wholly or in part of angular or crushed fragments.

6. That small amounts of shale occurring in the coarse aggregate will cause both excessive and uneven wear.

7. That the modified abrasion test for gravel in its present form is not an indication of the wear-resisting properties of coarse aggregates. It is suggested that if the severe impact action of the steel balls were decreased, much more indicative results would be secured.

8. That blast furnace slags should prove satisfactory for use in concrete pavements provided the proportion of light, porous slag is so controlled that the weight per cubic foot will be at least 70 pounds.

9. That the presence of large amounts of light, porous fragments in blast furnace slag will cause excessive wear.

10. That somewhat better results are secured by the use of the smaller sizes of slag.

11. That slag or stone screenings are, in general, unsatisfactory as substitutes for natural sand as fine aggregates in concrete road construction.

12. That the copper and lead smelter slags used in these tests would make satisfactory aggregates for concrete road construction from the standpoint of wear.

13. That coarse sands, other things being equal, show greater resistance to wear than fine sands.

14. That the so-called "tensile-strength-ratio" test is no indication of the wear-resisting properties of concrete made with these sands.

15. That the Talbot-Jones wear test is not, in general, an indication of the wear which takes place under traffic.

16. That neither the crushing nor the transverse strength of concrete is a measure of its wear-resisting properties.

17. That the addition of hydrated lime in the proportion used in these tests does not affect the wear-resisting properties of concrete.

18. That so far as resistance to wear alone is concerned, increasing the cement content beyond a cement-sand ratio of 1:2 does not materially affect the concrete. Leaner mixes, on the other hand, show considerable increase in wear.

19. That unusual precautions should be taken in using mine chats or other similar harsh-working materials, so as to increase workability to a maximum and thus make possible a smoother surface finish.

20. That, other things being equal, either an excessively dry or an excessively wet mix will show less resistance to wear than concrete of medium consistency.

Fire-Hose, Water Pressure and Hydrant Spacings

By William R. Conard
Consulting Engineer, Burlington, N. J.

THE hose generally considered as standard for fire-fighting purposes is 2½ inches in diameter, which at 90 pounds pressure at the hydrant gives a flow of approximately 195 gallons per minute through 500 feet of hose with a pressure of 20 pounds at the nozzle. Smaller hose gives friction losses too high in proportion to the usefulness of the hose, and 3-inch hose is considered too awkward to handle.

The writer believes that a water system should be so constructed as to supply an ample quantity of water for a sufficient number of hose streams to handle the ordinary fire with a water pressure of 90 pounds with the hydrants spaced not over 200 feet apart. This pressure is not a burden on the plumbing and will take care of a fire on the upper floors of an ordinary six-story building, while the firemen can work at a safe and comfortable distance from the building. This does not eliminate boosting apparatus, which is necessary when fire reaches serious proportions.

Advantages of Larger and Smaller Standard Sizes

A 3-inch hose 300 feet long will deliver 335 gallons of water at 90 pounds pressure as against 235 gallons when 2½-inch hose is used. The larger hose would be placed before the water had been turned on, and it is not likely that it would be disturbed until the "all out" signal had been given. Empty 3-inch hose is practically as easy to handle as 2½-inch hose, yet it delivers 100 gallons per minute more water.

By siamesing a 3-inch hose to two 1½-inch hose lines, either of which can be handled by one man as against two for the 2½-inch hose, it is possible to get within 15 gallons as much water and to attack a fire from two points instead of one. The added weight of hose to be carried to a fire makes very little difference since the motorization of hose-carrying equipment.

By using 3-inch hose for a portion of the line, it is possible to materially decrease the friction and increase the quantity of water delivered by the nozzle. The various combinations of 3-inch, 2½-inch and 1½-inch lines which can be quickly changed will produce different quantities of water in an advantageous manner from one or two separate lines.

It is not the intent of the writer to advocate 1½-inch hose for fires that require 3-inch pumping lines, reduced to 2½-inch size in order to handle them, but to try to present the advantages of the use of 1½-inch lines in combination with larger hose sizes.

ACKNOWLEDGMENT.—Abstract of a paper read before the New England Water Works Association, at Rochester, N. Y.

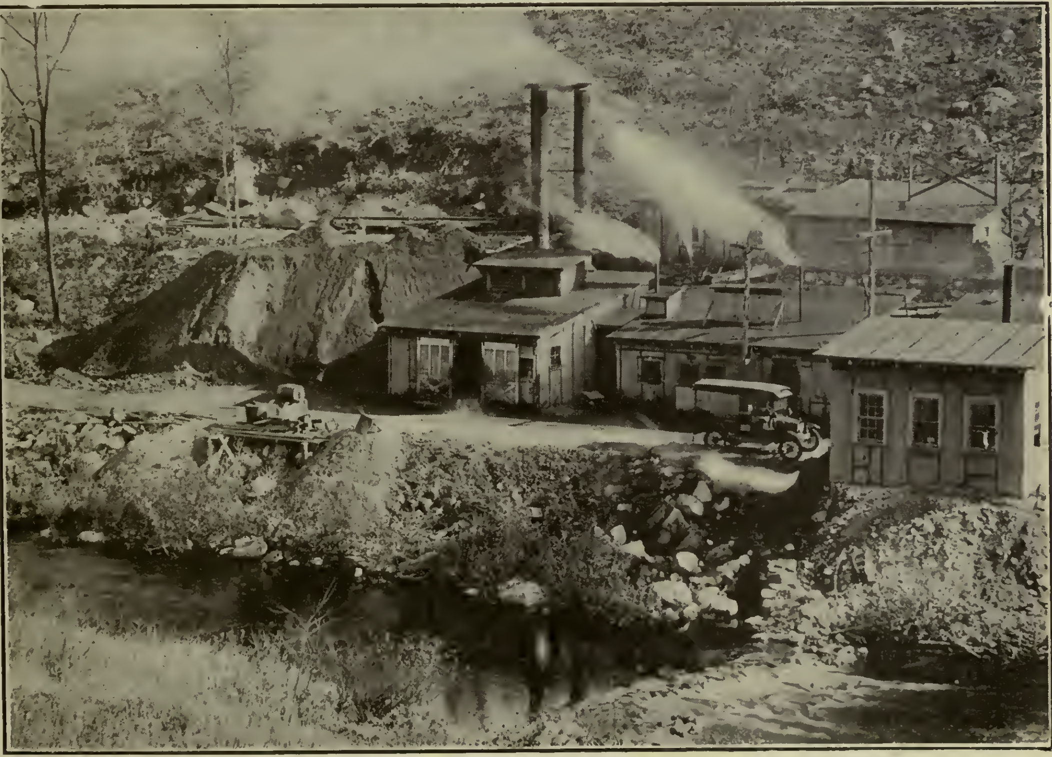
The Shepaug Tunnel Increases Waterbury's Water-Supply

Interesting Tunnel Job Handled by City Forces

By H. E. Davis

WHEN the city of Waterbury, Conn., realized that if it maintained its present rate of growth, a series of dry seasons four or five years hence would be likely to find it without sufficient water for its people, a wise decision was made to provide against that event. At present Waterbury draws excellent mountain water from the watershed of the tributaries of the Naugatuck River through several reservoirs previously constructed in this area and a pipe line from the southernmost one into the city. By building a dam across the Shepaug River, which lies to the west of the Naugatuck, and driving a tunnel through the intervening hills, a portion of the waters of this adjoining watershed, which the Shepaug naturally carries south into the Housatonic, can be diverted eastward into one of the existing reservoirs.

This project the Waterbury Board of Public Works undertook in 1919, placing its execution in the able hands of R. A. Cairns, who has served the city as Chief Engineer for many years, and has successfully carried through for it the construction of two large dams and other important work. On the basis of the efficient construction record of the city Bureau of Engineering, it was decided that, instead of employing a contractor, the Bureau should undertake the new tunnel and dam enterprise itself, and I. F. Story, who has worked with Mr. Cairns since 1908, was appointed resident engineer in charge of the work. Surveys were made and borings taken, as a result of which the line of the tunnel was run from a point on the Shepaug River about three miles north of its junction with the Bantam River east to the Bantam, thence in



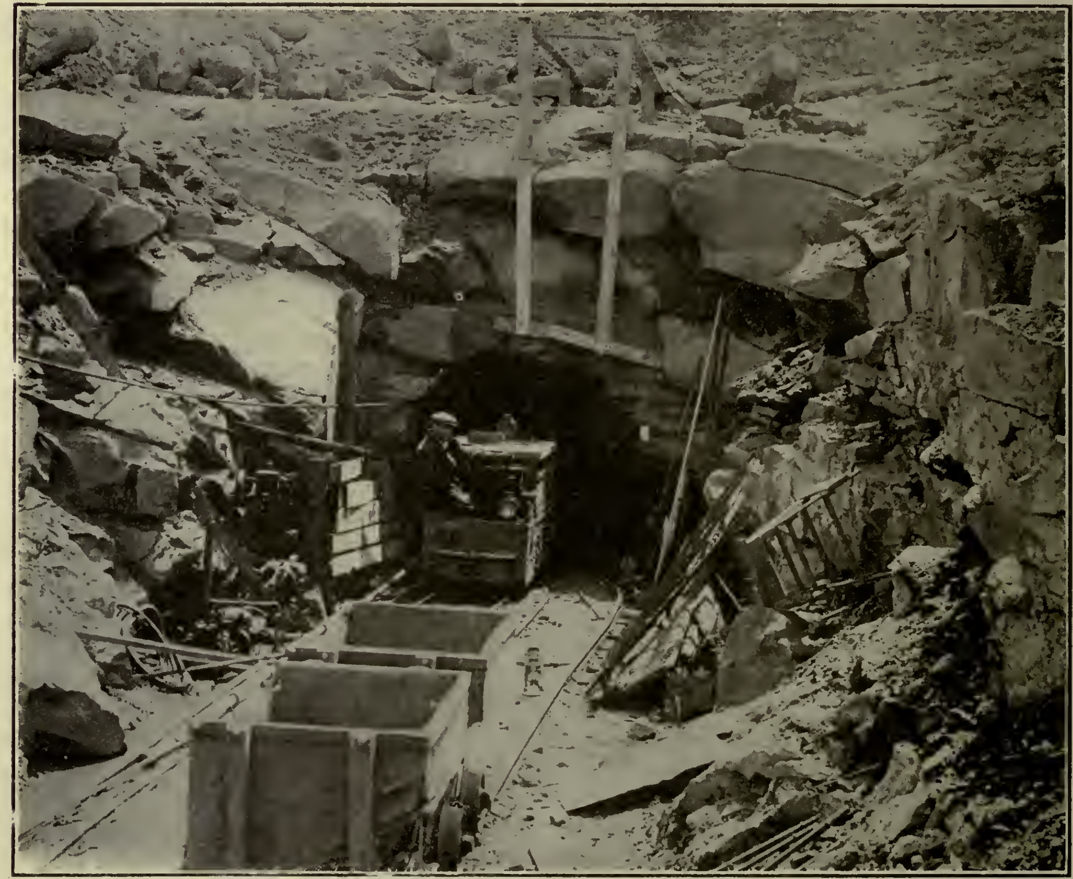
POWER-PLANT AT THE WEST END OF THE SHEPAUG TUNNEL IN NOVEMBER, 1923
In October, 1924, this plant was dismantled and moved to the east end of the tunnel

the same direction toward Bantam Lake, under the narrows of this lake in a southeasterly direction, and east again to the branch reservoir on the west branch of the Naugatuck River, a total distance of seven miles. A construction camp and power-house were built at the west portal of the tunnel, and in July, 1922, rock excavation was started.

With a small plant consisting of two locomotive type boilers, an air compressor, two electric generators, a forge and sharpener for drill steel, and a pump to lift water from the river, the tunnel, which is of horseshoe shape and approximately 7 x 7½ feet, has been driven from this portal, a distance of 6,500 feet. The rock is hard mica schist with occasional strata of very tough hornblende. The frequent changes in the nature of the formation introduced difficulties, and at times the work was so wet that it was necessary to lay a pipe line and put in compressed-air and electric-driven pumps to remove the water.

Driving the Tunnel

As is customary in tunnels of this size, a full face heading was carried. The standard round comprised either nineteen or twenty-one holes, including eight cut holes arranged to break a vertical V cut. The holes were drilled to a depth of 8 or 10 feet, depending upon the character of the rock, with two water Leyner drills set up on vertical columns. The holes were loaded with 60 per cent gelatin dynamite, 1¼ x 8 inches, tamped with sand in tamping bags, and fired by electricity taken off the lighting current. Ordinarily the cut holes were fired first, with No. 6 electric blasting caps; then the remaining holes were loaded, using the electric blasting caps in the relief and breakdown holes, first delay electric blasting caps in the roof and rim holes, and second delays in the lifters, and were all fired in a second shot. At times when the heading was in relatively soft ground and no relief holes were necessary, the whole round was



EAST PORTAL OF THE SHEPAUG TUNNEL, AT BANTAM RIVER connected in one series and fired in a single shot, the charges exploding in rotation.

As soon as the smoke and fumes cleared away sufficiently—and this was aided by a ventilating system composed of a reversible fan and a 12-inch pipe carried to within about 275 feet of the face—inspection of the face was made to see whether any "guns" had been left, that is, ends of bore holes which had not broken clear to the bottom. If so, these were loaded and fired to square up the face. A crew of three men then shoveled the muck back from the face far enough to enable the next shift to set up the drills and drill the next round. While this was being drilled and loaded, the mucking crew of eleven men loaded the muck and it was hauled out of the tunnel by an electric storage battery locomotive.

The muck cars, which are of the side-discharge type with wooden bodies on steel trucks, were designed and built on the job at a considerable saving per car over the all-steel car on the market. They stand up well in use and when damaged can be cheaply repaired.

Operations in this heading were carried on in two shifts, working day and night, and the rate of progress, which was creditable from the beginning, steadily increased. From the time the rock work started, on July 15, 1922, up to cessation of work in this heading in April, 1924, the average monthly progress was 287 feet. For 1922 the monthly average was 200 feet; for 1923 it rose to 302 feet; and for the first quarter of 1924 to 353 feet. The maximum advance in any one month was made in January, 1924, when a distance of 386 feet was driven in 54 shifts. The greatest progress in any one week was registered in December, 1923, with 94.4 feet in 12 shifts. The best weekly single shift record in this heading was 50.6 feet in 6 shifts.

Other Headings

In addition to the Shepaug River heading, three other headings have been started, one on the west bank of the Bantam River running westward to meet the Shepaug heading, one on the east bank, which will be driven to the shore of Bantam Lake, and another westward from the tunnel outlet on the west branch of the Naugatuck River. As the line of the tunnel running west from the Bantam River crosses a swamp, it is necessary to make an open cut there and build a concrete section. Most of the tunnel will not be lined with concrete but will be left as a natural rock channel. Between the two portals on the Bantam River a pipe line will be sunk to carry the water under this river. The plant at this location is equipped with three Economic type boilers and two two-stage air compressors of 800 and 1,000 cubic feet per minute capacity. Excavation in the new headings is being carried on by much the same system that was followed in the original Shepaug heading, and an excellent progress of 400 feet per month is now being maintained.

A TIMBERED SECTION OF THE SHEPAUG TUNNEL AT THE WEST END

The men are paid somewhat on the piece-work basis; that is, they receive a regular amount for drilling and loading each round, or for shoveling the muck, and quit work as soon as that job is completed. In addition, each shift is paid a bonus for any progress made by it above 36 feet per week. This system stimulates steady work and creates rivalry between the two shifts. A good rate of progress is being secured because the resident engineer closely supervises every phase of the work and because he and his assistants have the faculty of dealing with men and getting results from them, an admirable quality in any leader.

When Bantam Lake is reached, it will probably be necessary to sink a shaft and set up another plant. Just what conditions may be met in boring under this lake is still somewhat uncertain.

Forward Steps in Municipal Affairs

Training a Dynamite Squad in the Fresno Fire Department

FRESNO, CALIF.—Since the reorganization of the Fresno Fire Department two years ago, a strong effort has been made to develop this department into one that is completely educated along all lines necessary to make it competent and efficient. To that end, schools and drilling on hydraulics, chemistry, electricity, building construction, and other subjects, have been held.

There has also been in the minds of the chiefs of the Department for some time a determination to organize a dynamite squad that would be worthy of the name; in other words, a squad capable of operating efficiently whenever an emergency might arise. The formation of such a squad, however, was delayed until certain other school work had been successfully carried through, and particularly until the services of a recognized expert to conduct the school on the use of high explosives could be secured. The Department has been fortunate indeed in obtaining for this purpose the services of J. C. Costello, Assistant Sales Manager of the Giant Powder Company.

Prior to the beginning of the actual school work under Mr. Costello's direction, we succeeded in arranging for visits from six or seven recognized high-explosive experts. These men gave illustrated lectures on high-explosive work, thus building a foundation for the school which was to follow.

The dynamite squad was organized as follows: 14 members of the Rescue Squad Company; 4 district chiefs; 4 members of the Fire Prevention Bureau; and the Department Drill Master. The course was commenced with lectures, and later, arrangements were made for practical instructions in the use of explosives. The usual preliminary work in the way of digging trenches, etc., was done, and then, under the supervision of their director, the squad proceeded to dynamite a large brick tower. So efficiently was this piece of work handled, that the tower collapsed within itself, with no part of the tower falling more than 20 feet from its base.

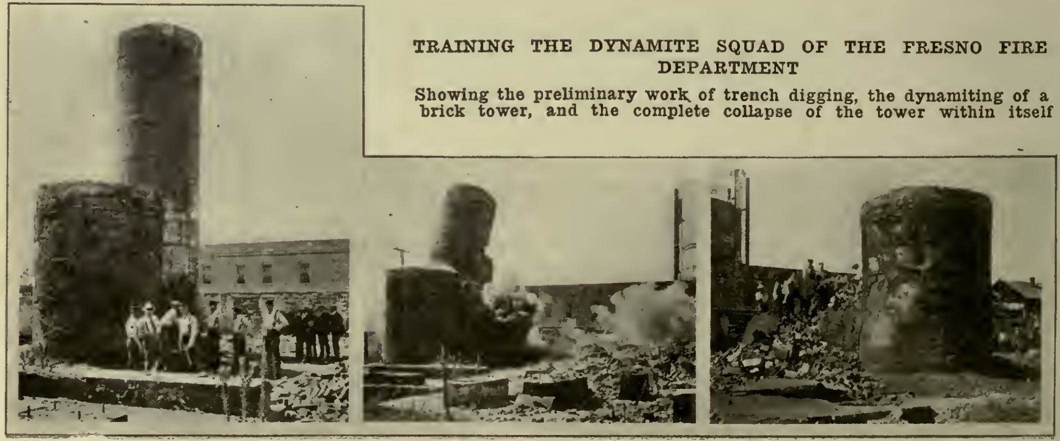
By having trained a dynamite squad of more than twenty men, we are almost certain to have in any emergency a number of men who will know how to carry on the work and who can intelligently direct the operations of less experienced men. This same theory has been applied in the instruction of the Department along all other lines, and the members, appreciating this opportunity for education, have taken every advantage of it. The Department feels that its efforts in this direction have been well repaid by the increased efficiency that has been evident in the work of the members on the whole.

THOMAS BAIRD,
Chief Engineer, Fire Department.

How a Small City Secured a Large Pool for Swimming and Skating

GARDEN CITY, KANS.—The construction of an all-concrete municipal swimming pool, that we believe to be the largest in any small city in the country, is an achievement of which this community of about 4,000 population is justifiably proud. The pool is 345 feet long, 210 feet wide, and has a depth of from 18 inches to 9 feet. Its entire cost amounted to about 16,000.

In February, 1922, the Board of City Commissioners conceived the idea that a large swimming pool was much needed in western Kansas, and that Garden City, lying in the well-watered Arkansas Valley and along the route of the Santa Fé trail, would be an ideal location for such a recreational feature. Realizing that the city could not afford to finance the project through taxation, the Board appealed to the Garden City Chamber of Commerce and other local organizations for assistance. With the aid of these groups, contributions amounting to over half the estimated cost were received. An attractive site for the pool was found in Frederick



TRAINING THE DYNAMITE SQUAD OF THE FRESNO FIRE DEPARTMENT

Showing the preliminary work of trench digging, the dynamiting of a brick tower, and the complete collapse of the tower within itself

GARDEN CITY, KANSAS—IN THE WATER AND ON IT

Finnup Park, a 100-acre tract of valuable land recently donated to the city by George W. Finnup, and definite plans for the construction work were soon under way.

To supplement the cash donations, the Chamber of Commerce solicited the cooperation of some local business men in working out a novel scheme whereby the necessary excavation work was completed without cost to the city. From these business men the Chamber secured a list of honest debtors who were out of employment at the time, and to these debtors the proposition was made that if they would furnish teams and men for the excavation job, the value of the work done would be credited to their outstanding accounts. This proposal was cheerfully accepted. Then the same proposition was presented by the Mayor before a meeting of the Garden City Elks Lodge, and 47 additional men and teams were supplied through that group.

Some idea of the popularity of the municipal pool may be gained from the fact that often during the heat of the summer as many as 500 bathers are in the water at one time. And during the ice-skating season, the pool again becomes the center of attraction to the crowds of enthusiasts for this winter sport.

H. O. TRINKLE,
Mayor.

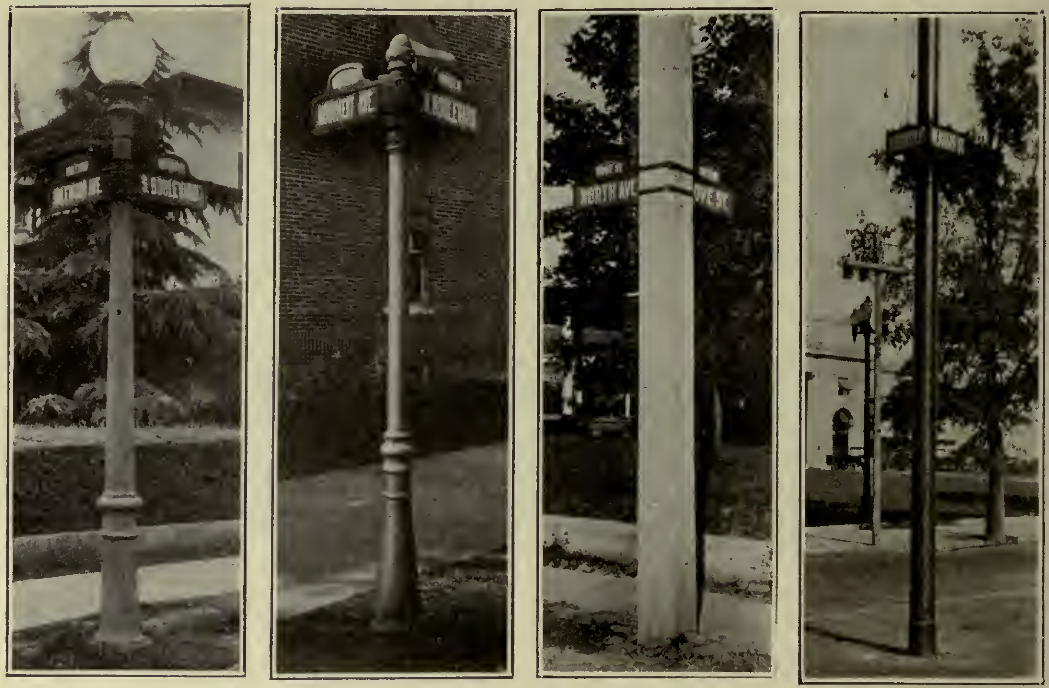
Street Signs for Richmond

RICHMOND, VA.—Until about nine months ago, Richmond was one of the few large cities in this country that had no system of street marking. While the need for adequate street signs was often felt, the work was continuously postponed because of the lack of funds for this particular undertaking. Finally, on June 15, 1923, the City Council made an appropriation of $10,000 for street signs, and later a second sum of like amount was added to the fund. It is estimated that it will require a total of $75,000 to mark all street intersections in the city.

In order to determine the most logical points at which to place the signs, and to estimate the cost of erection, the Bureau of Surveys of the Department of Public Works made a survey of each street corner, taking note of fire-plugs, poles, sewer inlet castings, and other obstructions, in addition to noting the type of sidewalk surface in each case. With the survey completed, and the first allotment of funds available, the responsibility for the actual erection of the signs was placed in the hands of the Director of the Department of Public Works.

In many cases it was found possible to utilize existing poles. Some of these were ornamental iron street-lighting poles and iron gas lamp-posts, owned by the city, that had been out of use for a number of years. Others were iron or concrete trolley poles owned by the transportation company, and the permission of this company for the attachment of the signs to its poles was secured. Plans were made showing the present dimensions of typical sections of the existing poles at the height above the ground at which we wished the signs placed, a clearance of 8½ feet from the ground to the bottom of the sign being allowed. Specifications were then prepared and sent to eight or ten leading sign makers, with request for estimates for furnishing their various types of poles, signs, brackets, etc. Samples of signs and attachments were required to be submitted with the bids.

The task of awarding the contracts was a difficult one and required considerable time and thought. It was finally decided to place with the Municipal Street Sign Company an order for their wing type signs and new iron poles, in addition to thirty-seven special box type signs for use on the city's main business street. These box type signs were placed on existing iron trolley poles in the center of the street. We also ordered from the Massey Concrete Products Corporation sixty-six concrete poles, and wing type signs to be attached on special bronze brackets. All iron frames, poles, etc., were given a coat of red paint



FOUR METHODS OF MOUNTING STREET SIGNS IN RICHMOND

before being shipped to the city, and upon their arrival here they were given two coats of green paint before being erected.

A porcelain enamel type sign was chosen.

The general plan adopted for placing the signs was as follows: On one-way streets, with a parkway in the center, signs were placed on the far corner in the direction of traffic at each intersection. On two-way streets, only one sign was placed at each intersection, these alternating from side to side so that each line of traffic may see the sign on the far corner at every other block. On the main thoroughfares, two signs were placed at each intersection, parallel with the curb, on diagonal corners.

We believe that Richmond will have no cause to regret the amount of money expended for street signs, and we are confident of being able to convince the City Council of the necessity for appropriating sufficient funds to complete the work. Not only are the signs of value in the matter of indicating the name and direction of the streets, but they give the streets a finished appearance of which we may well be proud.

J. N. EUBANK,
Chief, Bureau of Streets.

Pamphlets on Child Care Replace Health Department Bulletin

Bridgeport, Conn.—A new form of public health publicity has been inaugurated by the Bridgeport Department of Health, which it is believed will prove much more effective than the monthly bulletin heretofore issued.

It so happens that the Department, in its Bureau of Child Hygiene, has available enough nurses to make a visit each month to every home in the city in which during the year a baby is born. The births of these infants are of course reported to the Department, and within twenty-four hours after the receipt of the report, a nurse calls at the home to deliver a certificate of birth to the parents, and to give them such advice as she may in the care of the child. Beginning on January 1, 1925, the nurse will deliver, in addition to the certificate, a small loose-leaf binder in which the certificate will be placed, and in which will also be enclosed the first of twelve pamphlets relating to the care of the child and of other children in the family. Each month thereafter, for twelve months, when the nurse makes her regular visit to the mother, she will ask for the binder and will place within it another leaflet. As there are somewhat over three thousand births in Bridgeport each year, we will in this manner reach that number of families, rich and poor.

For many years the Department issued a monthly bulletin, "Bridgeport's Health," to the preparation of which much time and thought were given. It became apparent, however, that this bulletin failed to reach the great mass of people in the community to whom it would be of most value. It did, of course, reach a rather large number of certain individuals, members of local organizations and of the city government, merchants, business executives, etc., among whom it perhaps succeeded in stimulating an interest in the Department and its activities. While this is desirable in any community, it is even more desirable that the Department in some way reach the still larger group who make up the majority of the city's population. So the bulletin was discontinued, and the scheme outlined above will carry out in part the educational program of the Department.

As years go by, the percentage of the population reached through the nurses' visits will no doubt increase, and it is possible that the plan, if it meets with the success that we believe it will, may be extended to include other families with whom the nurses come in contact during these visits.

W. H. COON, M.D.,
Health Officer.

Cooperation Between Public School and Traffic Officials

HARTFORD, CONN.—The following is the essence of a working agreement which has been put into effect in Hartford for the prevention of traffic difficulties in connection with school children:

1. That the principal of each school will talk with the police officers on duty at near-by crossings on problems of school traffic.
2. That traffic officers will report, to the principal of the school involved, cases where the carelessness or wilfulness of individual children is causing the officer difficulty.
3. That each school will be provided by the Board of Education with a blue-print map of the streets of Hartford, to be known as the Accident Map, on which accidents will be recorded by push pins as they occur.
4. That, wherever possible, arrangements will be made at a school assembly or otherwise to have police officers in uniform speak to the children on care in avoiding accidents.
5. That the Superintendent of Schools and the Chief of Police or his representatives will as speedily as possible inspect the individual traffic crossings and make whatever recommendations seem necessary to their individual departments.
6. That a pre-view of a film on safety now being worked out by the Department of Motor Vehicles will be arranged at one of our schools when the film is ready.
7. That, wherever possible, school authorities will work out a more complete monitor system to keep the children on the sidewalk until they reach points made safe for crossing.
8. That the Chief of Police will direct the officers to require the children to stand on the sidewalk, that is, not to step from the curb until the signal is given.
9. That the Commissioner of Motor Vehicles will send a photograph of the map of Hartford showing traffic accidents during the past year.
10. That the Superintendent of Schools will arrange for a later conference between the members of the Principals' Club and a representative of the National Safety Council to determine where, if possible, safety instructions may be incorporated as a regular part of the course of study.

This plan is working out wonderfully well. Not only is it helping to reduce accidents to the children of to-day, but it is believed that these lessons in safety will be so deeply instilled that they will continue to be effective when the boys and girls of to-day become the men and women of to-morrow.

GARNET J. FARRELL,
Chief of Police.

A Friendly Greeting to Motorists

DELAVAN, WIS.—Motorists entering Delavan by any one of the four state highways that pass through the city are welcomed by the sign illustrated herewith, erected by the Citizens' League of Delavan. By suggesting to motorists that they drive leisurely and enjoy beautiful Delavan, instead of facing them with the customary warning, "City Limits—Observe Speed Laws," the Directors of the League felt that the same purpose could be accomplished and at the same time visitors would pass on with a more friendly feeling towards the town.

Tourists are further impressed with the fact that Delavan is a friendly community by signs on the highways reading "Motor Police," also erected by the League. These serve to call the drivers' attention to the fact that a motor patrolman is on the job. The officer, too, has been given strict orders to keep in the open at all times, and it has been made clear that his duties are to advise and direct tourists and to arrest only for excessive speed or reckless driving. He also has on hand

SCHOOL CHILDREN IN HARTFORD MUST NOT STEP FROM THE CURB TO CROSS THE STREET UNTIL THE "GO" SIGNAL IS GIVEN

THE FRIENDLY GREETING AT THE CITY LIMITS OF DELAVAN, AND ONE OF THE STREETS WHICH LEISURELY DRIVING WILL HELP THE MOTORIST TO ENJOY

a supply of small printed cards, gotten out by the League, for presentation to visitors. These cards urge motorists to make their stay in Delavan more enjoyable and to avoid accidents by the observance of the few traffic rules listed thereon. In addition, the cards contain a few interesting facts about the town, and suggest that those wishing road maps and other tourist information call at the offices of the League, where such help will gladly be given.

RAY O. WIKER,
Executive Secretary, Citizens' League of Delavan.

City Manager Introduces His All-Star Cast

THE third yearly episode in the drama of modern city government under the council-manager charter in Clarksburg, W. Va., during the year ending June 30, 1924, is presented by City Manager Harrison G. Otis in his recently published annual report to the City Council. The members of the all-star cast are introduced, and the results of their respective performances are summarized in part as follows:

The Finance and Accounts Department received high praise from the State Tax Commissioner's office. The Treasurer's cash balance for the year was the largest on record. The number of building permits issued exceeded that of former years, and the valuation of new buildings was more than twice that of two years ago.

The Police Department established a record for liquor arrests, and for the arraignment of criminals and the recovery of stolen property.

The Fire Department won commendation from the State Fire Marshal. Last year's per capita fire loss and loss of uninsured property were lower than in any previous year.

The Health Department was placed on the vanguard of health units by the State Health Commissioner. A phenomenal reduction in contagious diseases and a lower baby death-rate marked last year's progress.

The Public Service Department broke all records for the amount of street improvements, miles of road cindered, and the erection of street signs.

The Recreation Department's playground methods were featured in magazine articles, and were editorially praised in several of the nation's largest dailies.

The Public Library's circulation record jumped to nearly three times that of three years ago, and more new books were placed on the shelves than in any previous year.

The Legal Department saved the city thousands of dollars in defending damage claims and in enforcing collections in favor of the city.

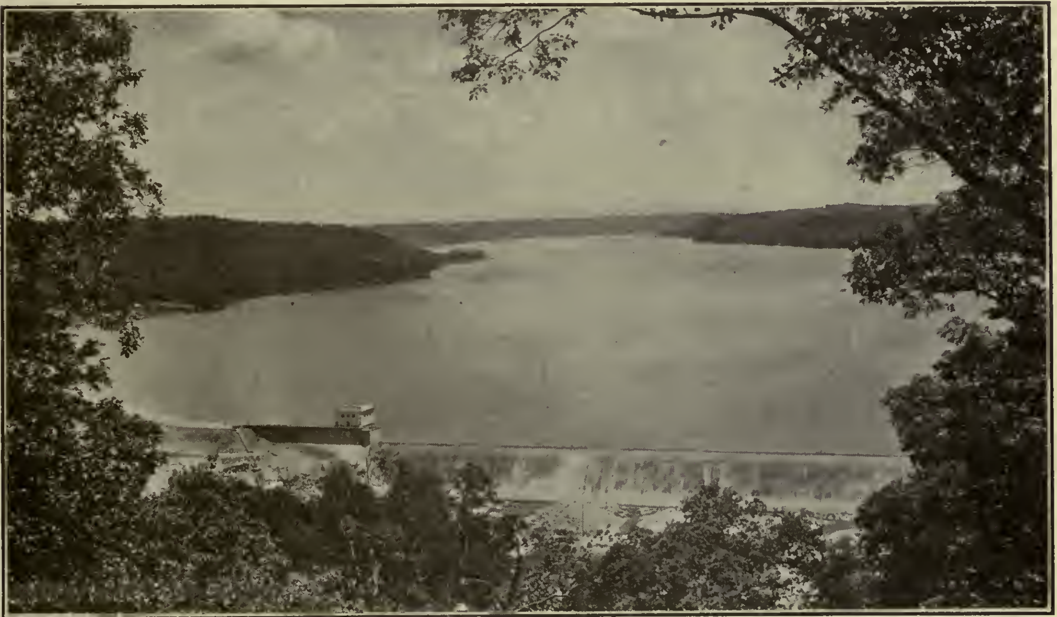
The New Water-Supply for Tulsa, Oklahoma

By W. R. Holway

Chief Engineer, Spavinaw Water Project, Tulsa, Okla.

DURING the last ten years the tremendous development of the Southwest has been one of the noteworthy facts of our national growth, a development not only industrially and agriculturally important, but record-making in the matter of civic achievement. Oklahoma has been a center of development and Tulsa one of the fastest-growing cities. Its population has risen from 18,900 in 1910 to approximately 111,000 in 1923. The cause of this remarkable increase has been the proximity to the rich oil-fields of the mid-continent section, and the spirit of the citizens, who have looked ahead and planned for the future on a big scale.

The water problem has been one of the biggest with which the city has had to deal, for almost as soon as the first wells were dug, it was discovered that they were going to be entirely inadequate as a source of supply. Then the city turned to the Arkansas River. Although there was an unlimited quantity there, the quality was extremely bad, for the Arkansas is one of the hardest, saltiest, and muddiest rivers in the Southwest. The water is not suitable for domestic use because of the salt content, which has been as high as 2,400 parts per million, salt flushed from the creeks of the oil country and from the salt plains of Kansas. The whole city purchases its drinking water in five-gallon bottles. The water is not suitable for industrial uses because it is so hard that only the most expensive filtration process will soften it. For some months of the year the water is not fit for any use whatever, on account of its mud content, which sometimes becomes even too heavy for the modern filter plant which Tulsa built in 1918, and which usually handles the purification of the water in an efficient manner.



SPAVINAW LAKE, SHOWING DAM AND GATE-HOUSE IN FOREGROUND

About a decade ago, when Tulsa's population figures began to increase by leaps and bounds, the builders of this city saw that good water was to be an imperative necessity. Up in the Ozark Mountains, 60 miles to the northeast, were clear, sparkling streams of cold, soft water, and one of the most beautiful of these streams was the Spavinaw. Certain far-sighted citizens began to talk of the possibility of bringing this water to the city, and various plans were suggested. In 1919, a bond issue for $5,000,000 was proposed for a plan whereby an expensive pumping and power system would bring the water to Tulsa; and this issue passed by a good majority, so eager were the people for a good water-supply. Later this election was declared void because of a legal technicality. In 1921, by a charter amendment, a non-partisan water commission was appointed, consisting of four members, two to be elected every two years, and the Water Commissioner to be Chairman. This commission invited George W. Goethals to come to Tulsa and look over the situation and recomend a course of procedure. His recommendation was for the Spavinaw source, if a preliminary survey showed this to be a feasible plan. This survey was carried out in the summer of 1921 by the Holway Engineering Company of Tulsa, after a bond issue of $25,000 had been voted for this purpose.

The report of the survey presented a gravity plan for bringing Spavinaw water to Tulsa and stated that the cost would be $6,800,000. In November of the same year a bond issue for that amount was voted, 5 to 1. This was one of the largest per capita bond issues ever carried for water-supply in this country. In April, 1922, W. R. Holway of Tulsa and J. D. Trammell of Fort Worth, Tex., were retained as engineers, and Dabney H. Maury of Chicago as consulting engineer, and work was immediately started on the final surveys and preparation of plans and specifications. In September, 1922, eleven contracts were let on this work. Later, six more were let, and $700,000 additional in bonds voted. In February, 1924, the contractors for the laying of the concrete pipe abandoned their contract and the work was completed by the city under the direction of W. R. Holway, Engineer for the Water Commission. A rather unusual thing was accomplished here, for the contractor's superintendent and foremen were replaced with men from the engineer's organization, and the whole work was carried to a successful completion in October, 1924, almost exactly two years from the date of letting contracts. On November 17, the city fittingly celebrated the turning of the water into the mains.

Precast Concrete Pipe Used

The most important question to be decided at the time of letting contracts on this work was the type of pipe to be used. The final decision was in favor of precast, reinforced concrete pipe, for the reasons that it was especially adapted to the low head under which this water would flow, it was comparatively cheap, and was permanent. The make of pipe adopted was the Lock Joint reinforced concrete pipe, and the sizes 60 and 54 inches, 28 miles of the former and 25 miles of the latter. This conduit will furnish 25,000,000 gallons of water per day. The manufacture of this pipe was accomplished in an efficient and noteworthy manner, for the whole 53 miles was made in 13½ months. The plant, which covered 40 acres, was located about 20 miles east of Tulsa on the Frisco Railroad. Nearly all of the raw material except steel came from Oklahoma points. A complete standard-gage railroad served the yard and brought in this material and moved the finished

SECTION OF THE CONCRETE PIPE LINE, SHOWING THE CONSTRUCTION RAILROAD AND ONE OF THE AMERICAN LOCOMOTIVE CRANES

TIMBERING IN THE TIOWAH TUNNEL IN SECTION 3-A OF THE SPAVINAW WATER PROJECT

pipe. Four units, each with a capacity of ninety-six 12-foot lengths per day, worked independently and simultaneously. Double gantry cranes handled the forms, reinforcements, and finished pipe, and poured the concrete. Great care was taken to insure a dense, smooth concrete. Tests on approximately half the line show a leakage far below the specifications of the contract. Each length was [illegible] for a **certain head**, and so had to be distributed to a certain point on the line.

The determining factor in the time problem of this project was the distribution of the pipe, each joint of which weighed 6 tons. There were five railroads and ten good-sized streams to cross. A standard-gage railroad was built paralleling the entire pipe line, and the maintenance of this railroad during the rainiest years Oklahoma has ever seen was one of the difficulties of the project. But after the city took over the work, the railroad was successfully operated.

Midway of the conduit is a ridge 2 miles wide. Through this a tunnel, 7 feet in diameter, with 84-inch monolithic approaches, was constructed. In order that Tulsa might extend the water system without having to bore a new tunnel, this was designed to carry three times the capacity of the pipe line.

Impounding and Storage Reservoirs

A 55-foot solid masonry dam, 3,500 feet long, impounds approximately 20 billion gallons of water, forming Spavinaw Lake, 6 miles long and covering 1,800 acres. This reservoir site is one of great beauty, lying in a narrow, wooded valley. Although Spavinaw Creek, at the dam site, is at the same elevation as the Arkansas River, on the banks of which the city of Tulsa is built, the water flows entirely by the force of gravity from Spavinaw Lake to the receiving well at Mohawk pump-station. This is made possible by the fact that Bird Creek Valley, 5 miles north of Tulsa, is 50 feet lower than the Arkansas. This 50 feet, together with the 50 feet obtained by building a dam on Spavinaw Creek, gives sufficient head for the gravity flow. At Mohawk a large storage reservoir has been built, holding 500,000,000 gallons, which will serve as an emergency supply. On the bank of this reservoir is the pumping-station, which lifts the water through a 30-inch steel pipe to a concrete-covered distributing reservoir one mile north of the city, from which it flows directly into the city mains. This latter reservoir holds a little more than one day's supply.

The successful carrying out of a project involving 7½ million dollars in so short a time was possible only by reason of the fact that the entire project was handled by a Board of Water Commissioners, consisting of five of the leading citizens of the city, who have given freely of their time, energy, and judgment, to assure their city of the best possible water-supply in the shortest possible time at the least possible cost.

Period of Loans on Road Work

THE Finance Committee of the Cheshire, England, County Council has considered the policy of not permitting loans to be sanctioned for main road and bridge purposes for a period exceeding the life of the work, according to *Roads and Road Construction*, London, England. The following estimates of the expected life of foundations, pavements and bridges have been determined as fair averages.

Foundations	10 years
Water-bound macadam pavements	3 years
Tar macadam	5 years
Asphalt	7 years
Granite block paving	15 years
Land	20 years
Bridges	30 years

A Plea for Imagination in Playground Design

By Horace W. Peaslee

Park Architect, Washington, D. C.

WHEN I think of playgrounds—not the exceptions, but the average run of playgrounds—a definite visual image presents itself, an image of large areas void of planting and sparse of turf, of pipe-framed swings and pipe-framed bars and divers other mechanical contraptions, of much organized and systematized effort. There is such a prevailing uniformity of type, based no doubt on certain well-founded ideas of operation, that one can find little trace of the park or landscape designer's handiwork within the borders, little evidence of individual handling by a designer who takes nothing for granted, but questions and studies each and every point as he meets it. With your permission, I am going to raise some of these questions without attempting to answer them.

Is there no common meeting ground of the park system and the playground system? Must the playground maintain itself as a unit of such obnoxious bulk that it cannot be swallowed by any park scheme? Is it possible for the playground camel to be content with his head alone in the park tent, or will he proceed to oust the master if admitted?

If the park comes to the playground, must it be restricted to the outermost edges? Cannot the play scheme be broken up into smaller units with their definite lines of demarcation? Must playgrounds always lie in the open?

Must there always be the same combination of equipment? Must it always be of the same standardized, obviously efficient type? Is it subject to adaptation and modification to lend itself to park conditions? Can it be broken up into occasional units placed where oportunity permits and used without supervision?

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A quaint old French print shows the central feature of a garden to be a combination of seesaw and merry-go-round. A Colonial garden shows a "bouncing-board" of similar characteristics. Is it too difficult for the modern park designer to incorporate such a feature in any part of any park? They were sightly enough to be elements of design in the old pictures. Even the grown-ups were not too dignified to indulge occasionally.

. . . . .

In a Zurich park, there's an open space surrounded by trees. In the center of the space is a hill of sand. A careless grown-up might call it a small mound, but to the child it's as difficult to scale as the treacherous Mount Everest and as easy to descend as a splinter-proof slide. There's no lawn to spoil, just a natural woodland floor. It's unquestionably the children's corner, but instead of spoiling the park for the adults they actually sit around there to watch the play.

. . . . .

Consider the wading pool, usually as stiff and formal as a bathtub and therefore fundamentally obnoxious to the child. There's nothing exciting about it. Now regard the possibilities of our Rock Creek or your equally precious park brook at the place where every once in the while it overflows and spoils the scenery. I wonder if it would suffer by designation as a Junior Navy Yard. Considering the crudeness of an existing boulder dam, I do not believe that a pair of low barriers, about like fords, would injure the appearance—and think of the possibilities for navigation and manufacturing-plants. I recall a group of boys who constructed such dams across a little stream and dug canals with locks and made mill-wheels out of cigar boxes and battleships out of everything. Every little freshet would wipe the slate clear for another effort —and consider the value of the experiments and the experience.

Aside from a few squirrels and birds, what do the parks provide of special interest to children? In statuary, practically nothing. Of local interest, there's a jumping horse in Lafayette Park and one sitting down at Sheridan Circle. I have never seen a statue of Santa Claus or Robin Hood or of Little Lord Fauntleroy. London has its Peter Pan. Berlin has its Children's Garden with the statues of Little Red Riding Hood and other characters of definite interest. Would it be asking too much of a park designer to produce one little Garden of Goblins? There are quaint little grotesques just suitable for the purpose. Precedent? Why years and years ago, one Matthew Vassar who was serious enough to found a college could unbend sufficiently to deck his garden with amusing French grotesques of dandies and beggars and soldiers and the like. It would be a wonderful accomplishment both for the children and the public if we could even collect in one place, carefully screened, all the cast iron dogs and deer once so popular for lawn adornment but now becoming so rare that, like shell flowers and Rogers statuary, they bid fair to again become *objects d'art*.

Some day I hope to do a Children's Park. It will start off with plenty of established trees, with the shrubbery thus kept up in the air out of the way. Undergrowth will be disposed so as to follow the lines of least resistance. There will be plenty of elbow-room, plenty of good, plain dirt and plenty of smooth pavement, each for its special use. There will be a Mystic Maze and a Tunnel and a Tower, also an unexpected slide and a secret fountain, in the best Italian manner, to show the new boys. And the statuary will be strictly appropriate. What was once known as the playground will be called the Circus. It will be enclosed by a low wall with a long seat on a platform, like a hippodrome. The apparatus will be quite spectacular in form and color. There will be some animal with an infinite capacity for peanuts—not a camel. Grown-ups will be admitted as spectators. I anticipate that the Scout organizations will be in charge.

It is unnecessary to go to such extremes immediately, but special opportunities are always at hand. For example, we have in Georgetown an abandoned reservoir shaped like a beehive and open at the top like the Pantheon. The ground has been filled around it almost to the top, and there after a long climb one finds a river view. But imagine that reservoir shell opened at the bottom to the street level and at the top with barred windows from the promenade. It might be a skating-rink; it would be a wonderful play palace even on a rainy day. And the echoes go round and round, never reaching the neighbors.

No two cities present the same problems or the same opportunities, and no general prescription can be given. I have merely tried to raise the questions with you for your answer in your own case. The main plea is to regard the playground problem, not as a solid obstacle to be camouflaged by the arts of landscape design, but as a group of elements to be studied anew for their possibilities as individual park features.

From a paper read before the joint meeting of the American Civic Association and American Institute of Park Executives, at Washington, D. C., October 8, 1924.

Landscaping, Fencing and Surfacing of Playgrounds

IN developing a playground the element of beauty must not be overlooked, yet as much free play space as possible must be preserved. Flower-beds or shrubbery have no place on the playground except in irregular corners. They take up too much valuable space and require an exorbitant amount of time and labor in maintenance. If shrubs are desired as screens, the fence should be set back, and the shrubs planted between the fence and the sidewalk, but not close enough to the sidewalk to interfere with pedestrian traffic. Trees should be planted close to the border of the playground, or near the apparatus to afford shade. Trees of low height and giving dense shade as quickly as possible should be planted in preference to slow-growing elms.

All playgrounds should be fenced, not only because fences improve the appearance of the playground and the abutting property as well, but because it is a safety first measure. Children are not apt to run heedlessly off the playground and under the wheels of traffic if there is a fence around the playground. Fences also reduce the problem of landscaping, as flowering vines, rambler roses, and other climbing species of plants planted along the fence greatly improve the playground. The fence should be five to seven feet in height, barbed at the top to prevent climbing. The fence should be constructed of two-inch mesh, chain linked, galvanized after fabrication steel wire, with galvanized steel posts and top rail.

Surfacing is a big problem. It is difficult to make grass grow when it is being constantly trampled down, yet a bare playground is unattractive, and the dust is a big nuisance to the neighboring housewife. A suitable playground surface must be porous enough for drainage, yet firm enough to stand up under constant use when it is wet, and not raise a dust when it is dry. Gravel, cinders, cement, have not proved satisfactory. Asphalt is too expensive and hot.

Detroit has found that a surfacing of limestone screenings and calcium chloride has proved very satisfactory. It is porous, drains easily, can be used immediately after a rain. It does not develop soft spots. It is soft after a thaw, yet packs down readily after the frost is out of the ground. This surfacing has a foundation of four inches of hard cinders, wet down and rolled with a steam roller. (Cinders must be kept wet while rolling.) Next, three inches of limestone screenings is applied. This also is wet down and rolled to a true grade with a horse-drawn roller. Calcium chloride is applied at about 1½ pounds per square foot. Then, ⅛-inch of a sharp torpedo sand is put on. The calcium chloride absorbs moisture from the air, and forms a binder coat with the sand and limestone screenings, giving a smooth, white, dustless finish to the playground.

Buildings, especially lavatories and storage space, are absolute essentials to a playground. The design of such buildings should be equal to, or better than, the surrounding architecture. The buildings should be made of brick, stone or cement. Wooden buildings should never be erected, as they soon become an eyesore rather than a benefit, showing the effects of wear and abuse, which unfortunately the American public gives to its public buildings. Wooden buildings are a source of big expense in maintaining. Buildings should have limited plantings of shrubs around them; climbing vines are preferred.

Playground apparatus should be sufficient to meet the demands of the playground. It should be made of galvanized steel pipe guaranteed against rust. Rusty apparatus frames, and usually those made of wood, are unsightly. Large gym frames, or "plumbers' exhibits," as they are often called, are not recommended unless located upon playgrounds in communities which know the value of and how to use them—such as the Turnverein, sokols or other national gymnastic groups.

—From the Report of the Playground and Recreation Committee of the American Institute of Park Executives, presented at Washington, D. C., October 9, 1924, by C. E. Brewer, Chairman, Commissioner of Recreation, Detroit, Mich.; J. R. Batchelor, Playground and Recreation Association of America; V. K. Brown, Superintendent of Recreation, South Parks, Chicago, Ill.

A City Club's Weekly Luncheon Programs

THE City Club of Portland, Ore., serves a wide assortment of information with its weekly luncheons. This club, whose membership comprises about a thousand of the leading business men of the city, purposes "to inform its members and the community in public matters and to arouse them to a realization of the obligations of citizenship." A Portland business man, by attending these luncheons each Friday for the past year, as several hundred of them do, is now well informed on a large range of the issues of the day, for these talks, almost without exception, are made by experts in various fields.

The City Club has seven sections: city planning; government organization and public finance; education and recreation; port development and public utilities; public health; public safety and defense; and social welfare. Most of the lectures may be classified in one of these fields.

City planning, a subject of appeal to any civic organization, provided a theme for several meetings. The Portland City Engineer spoke of the need of a city plan. The city Inspector of Buildings gave a timely talk on traffic control as a city planning problem, this at a time when the City Council was endeavoring to improve upon the present system and while the question was one of interest to every motorist and every pedestrian in the city. The Superintendent of Parks summarized Portland's achievements in parks and recreational facilities. Housing problems were discussed by a New York expert.

The rapid increase of population in Portland has resulted in the overcrowding of the schools to the point of decrease in efficiency. In view of this emergency, the school board wished to determine the possibility of establishing a work-play-study system on the basis of the Gary plan. Miss Alice Barrows, of the U. S. Bureau of Education, who spent several weeks in Portland making a survey of the school system, reported some of her findings, and William Wirt, Superintendent of Schools in Gary, Ind., gave a talk on the multiple use of school buildings through the work-play-study plan.

Features of government organization and public finance included the state income tax—perhaps the most discussed subject throughout the state—voting machines, farm finance, the present financial situation, and the business outlook. A comparison of Portland's harbor with that of other world ports was made at one meeting.

The fact that Portland, especially since the opening of the new University of Oregon Medical School, is rapidly becoming the medical center of the Northwest, may account for the emphasis on questions of public health. A speaker of the National Tuberculosis Association described the success of the present endeavors in this field. The work of the State Board of Health was presented by several of its members, who attended one session in a body. Pasteurized milk, foods and resistance, and the hoof and mouth disease were among other subjects discussed. The City Club by no means limits its program to matters of local or even of national interest, but has also gathered speakers and subjects from the world at large.

Allentown Realtors Help Save Taxpayers' Money

THE Allentown, Pa., Realtors through their Municipal Affairs Committee have taken the leadership in "getting their city out of the mud," through active interest in a local paving project, and saved the taxpayers a considerable sum.

During the spring and early summer the city government advertised for bids for paving, but such bids as were received were at prohibitive prices. This was due to the fact that permanent improvement of city streets was paid by assessment of the abutting property, the liens being given to the contractor doing the paving. Naturally, some of these liens were hard to collect and involved court proceedings. Under the circumstances, the contractor had to figure interest on the money tied up as well as cost of collection, making the cost of the improvement very high. This year's paving program was quite extensive, involving the paving of streets in sections where many very desirable new houses are under construction, and the delay threatened to seriously retard the city's progress.

The Municipal Affairs Committee studied the situation thoroughly, consulted with the Highway Department, and then recommended that an ordinance be passed authorizing the issuing of "construction bonds" by the city to finance this work, the city to collect from the property owners during the ten-year period as provided by law. An ordinance thus dealing with the situation was passed on first reading on Monday, July 21, 1924, and finally adopted; bids were advertised for, and three reliable bidders submitted bids. When the bids were opened, on August 30, 1924, it was found that the saving to the property owners will more than cover the carrying cost of the bonds.

This program, with its large saving of the taxpayers' money, was worked out, advocated, and passed solely through the activity of the Allentown Board, working in harmony with City Council.

—*National Real Estate Journal.*

NIGHT VIEW OF MAYWOOD INSTALLATION, SHOWING DISTRIBUTION OF LIGHTS

The Maywood, Illinois, Street-Lighting System

Complete Installation of 1,784 Lamps Made at Cost of $270 per Lamp

By F. Woodmansee

Woodmansee-Davidson Engineering Company, Consulting Engineers, Chicago

IN Maywood, a suburb of Chicago with a population of 12,000, there was installed a year ago one of the most complete residential street-lighting systems in the United States. It involved the erection of 1,784 posts for incandescent lamps. The outstanding features of this series type of street-lighting installation are (1) the compact design of the substation, (2) the completeness of the underground duct system, and (3) the use of individual disconnecting series transformers mounted in the base of the pole itself.

Although only 12 circuits are now in use, totaling 360 kw., the substation has ample capacity to allow the lighting load to expand to 800 kw. The main thought behind the design of the entire lighting installation was to insure complete harmony with the buildings and surroundings in this high-grade residential suburb. The Board of Trustees of Maywood desired an installation which would require minimum maintenance expense, because such charges are paid from the general expense fund, while the initial cost could be paid by a special assessment. Therefore, the trustees thought it advisable to install a sys-

DAYLIGHT VIEW OF SAME LOCATION AS ABOVE

tem which, while more expensive at the start, would be economical to maintain. For this reason an expensive underground duct system was installed, which finally resulted in a total cost of $7,290 per mile of street lighted.

A spacing distance of 165 feet, using a staggered system, was chosen in the main residential section in order to provide sufficient light for automobile traffic. For the business district it was necessary to obtain a much higher distribution of light. Accordingly, the lamps were placed about 65 feet apart. These circuits were made as short and direct as possible.

Energy is obtained from the Sanitary District of Chicago, which brings a 12,000-volt underground line into the 36-kw. substation at Sixth Avenue and St. Charles Road, Maywood. Here, in a space of 45 x 19½ feet, is contained all of the outdoor control-switching equipment that is used in serving the lighting and pumping plants of the Maywood district. In building the substation it was felt that to insure compactness and at the same time provide an auxiliary bus, special construction was best. Two-inch galvanized iron pipe furnishes the supports of the substation. The top of the station proper contains the three phases and a ring bus, the neutral. From these buses the circuits drop down through 30-ampere fuses to the voltage regulators. All the main buses and taps from the buses to the fuses and oil switchers are made of ½-inch copper tubing, while the taps from the fuses to the regulators and from the oil switches to the cable end bells are made of No. 1 solid copper wire. The bus-bar supports are rated at 7,500 volts. Available space is afforded for future extensions of this substation, should additional lighting circuits be necessary. With the substation mounted directly over the 6-foot wide duct, the circuits run from the regulators through the disconnecting switches directly into the cable duct sunk in the ground below the concrete piers. From here the circuits go to the outgoing feeders. By having regulators on both the other faces of this rectangular substation, much less space was required than if they were mounted all in a single straight line. The main buses are energized from the incoming line, by bringing the latter up from the 6-foot wide duct through 4-inch bituminized-fiber conduit to the 200-ampere, 4,000-volt oil switches and then on up to the main buses on top of the substation. Since the incoming circuits also feed the pumping load of Maywood, the 200-ampere, 4,000-volt oil switches on top of the substation are also employed as bus-sectionalizing switches.

Although the substation is very compactly built, a space interval of 18 inches is kept between the buses for safety. All the oil switches mounted in this substation are operated as a unit from the ground by means of a 180-degree mechanism. While all this equipment is installed out of doors, provision is made for the installation of recording instruments within the main pumping-station. Both the current and the potential transformers are mounted below the main top buses. The circuits for these recording instruments run through three 1-inch iron conduits into the station. Because of the fact that this installation was built in the street over an old sidewalk, it was necessary only to construct a concrete base for about three-quarters of the foundation. Continuity of transformer service is guarded by the installation of a duplicate set of transformers. The method of numbering the circuits on one side as odd and even was followed for the purpose of ready identification of circuits.

THE HARP FIXTURE WAS USED BECAUSE IT IS EASY TO CLEAN

The Conduit System

The reasons for the choice of an underground duct system, besides those mentioned above, were several. In the first place, the fiber ducts laid in concrete would prevent electrolysis, an evil commonly encountered with the use of a parkway cable. Again, there would be no danger of cutting the cable during trench excavation work for tapping water- or gas-mains in the street. Another factor was that a burned-out cable in a duct system can be very readily removed and replaced, whereas a parkway cable failure is difficult to locate, and would have to be dug up completely in order to be replaced. All these ducts were installed so that their tops were approximately 16 inches below the surface of the earth, to avoid any danger from the cables freezing. The entire conduit system was constructed of fiber ducts with ¼-inch walls.

The duct lines were designed for various types of handholes and manholes, each built to fill a special need for its own type of post foundation. All of these manholes and handholes are at the elevation of the sidewalk. Where there is no sidewalk they were placed about 6 inches above the natural surface of the ground to provide for the time when sidewalks should be laid. They were installed in this manner to prevent surface water from running into the duct lines. All the duct lines drain into manholes at street intersections, where sewer connections are made.

DETAILS OF POLE BASE TRANSFORMER INSTALLATION

The trenches were dug by hand, and the entire system was installed in the parkways 3 feet from the sidewalk in order to obviate much digging up of the pavement. Six months' time sufficed for the entire job, and there was no blocking of traffic, owing to the care taken to dig close to the sidewalk. These duct lines were planned and laid out as straight as possible in order to reduce to a minimum the primary circuit mileage. All indirect runs to lamps in odd locations were made on the secondary sides. The concrete used in the duct lines consisted of one part cement, three parts sand, and five parts crushed stone. The stone used in this concrete was crushed limestone, and was large enough to pass through a screen having ¾-inch round holes. Each section of concrete was poured alternately as each layer of fiber duct was placed. After all the concrete lines had been laid, the contractor was required to let them set for 24 hours before the earth was replaced. To insure care, the constructor was held responsible for damages to the sidewalk or pavement. The entire cost of laying the circuit system was $153,441.44. This brought the cost of a mile of circuit up to $2,575.24.

The main feeder cable from the manhole at First Avenue and Roosevelt Road, which brought the energy to the substation, was three-conductor No. O, B & S., rated at 12,000 volts. This cable has a 7/32-inch paper insulation over each conductor and 6/32-inch paper over both of them. The lead covering is 9/64-inches thick. While the primary operating lighting voltage is 4,000, both the primary and secondary conductors are of the same size—No. 6, B. & S. copper wire. The difference, however, lies in the thickness of insulation. In order to obtain some factor of safety, 5,000 volts was the tension chosen for this cable. The primary circuit has 6/32-inch insulation with 30 per cent Para rubber and tape insulation with a 5/64-inch protective lead covering. The secondary conductors from the transformers, running up through the middle of the pole to the lamps, are single-conductor, No. 6, B. & S. solid wire with 1/16-inch 30 per cent Para rubber-tape insulation covered with 1/16-inch lead covering. All the cables were required to withstand the factory test of two and one-half times the operating voltage between the conductor and the lead for a period of five minutes. After the cables were installed, they were tested to a value of twice the working voltage between the conductor and the lead for a period of five minutes, operating at a normal frequency of 60 cycles.

No difficulty was encountered in the joining of these cables, as the standard methods normally employed by electrical utilities on such low-voltage installations were employed. However, care was taken to see that the temperature of the petrolatum was high enough when pouring, in order to avoid the formation of air spaces in the joints.

This installation is one of the first to include a large number of transformers of the individual disconnecting type mounted in the base of the lamps themselves. These were furnished by the Kuhlman Electric Company of Bay City, Mich. They were chosen to permit ease in disconnecting the lamp from a primary circuit. Should there be trouble with a transformer or a test be desired, the primary connection plug can be pulled out and reinserted in a sleeve, and the main circuit will go on functioning. Three minutes will suffice for this. This connection plug and socket are self-centering, so that a perfect connection is always obtained. Because of the connecting sleeve, the transformer is always water-tight, thereby allowing the transformer to operate in the base of a post or when buried without any protection in the ground. This joint also obviates the need of wiping cable connections and of obtaining competent cable splicers to do this work. The lead cable is soldered to this connector, which can be handled by ordinary electricians. These transformers, together with the disconnecting sleeves, have withstood all water-submerged tests at 10,000 volts. By placing them in the base of the pole itself wherever possible, installation costs have been materially lowered as compared with apparatus requiring a complete underground manhole for each lamp. The transformers are of the standard 6.6-ampere, constant-series type, having a single conductor of No. 6, B. & S. rubber-insulated lead-covered cable. The primary circuit runs directly to the 250-c.p. tungsten lamp up through the center of the pole. The core and coils of the street transformer are installed in a welded galvanized-iron case which is so constructed as to be water-proof. The transformers were rated to withstand 20,000 volts, 60 cycles, for one minute between the primary and secondary windings. They have an operating efficiency under normal conditions of 92 per cent with a power factor of 98 per cent.

SOLDERING LEADS IN TRANSFORMERS

Acknowledgment.—Abstracted by permission from the August 9, 1924, issue of the *Electrical World*.

Chicago Plans an Underground Garage

If plans under consideration by the Board of South Park Commissioners take shape, traffic conditions in Chicago will be alleviated within a reasonable length of time.

Several months ago the Chicago Board of Commerce presented a plan for an underground garage in Grant Park It was this plan which was O. K'd. at the last meeting of the Board, provided the legal, financial, and engineering details could be worked out successfully. Subcommittees of the Association's Street Traffic Committee are preparing definite plans touching these details.

At the meeting of the Board were representatives of State Street merchants in addition to men from the Association of Commerce. Pedestrians take their lives in their hands when they cross a street in Chicago, and if they come to the Loop in their own motor cars there is not sufficient space at a convenient distance for Loop shopping in which to park them. The situation is becoming acute.

The present plan incorporates the building of a series of underground units for housing cars. Each unit is expected to care for 306 cars. Each section of the unit, 25 x 60 feet, will store 6 cars. It is estimated that the average cost of construction will amount to $1,500 per car. If the structure at present under consideration is erected, there will be a one-story building whose top will be from 3 to 6 feet below the surface of the ground. Inclined roadways connecting with street intersections would be made for the coming of motors from ground level to the underground garage. The unit system is looked upon with favor, since it permits the work to go on as conditions make additional space necessary. By building as space is needed, no uselessly large expenditure is called for.

Motorization for Street Cleaning and Refuse Removal in Chicago

By William J. Galligan
Assistant Superintendent of Streets, Chicago, Ill.

THE need for motorization of the equipment of the Bureau of Streets of Chicago in street cleaning and refuse removal will be understood more readily if the city's size and mileage are fully realized. Chicago has a population of over 2,900,000; an area of 200 square miles, 20 miles in length, 10 miles in width. It has 2,300 miles of paved streets, 1,050 of unimproved; 450 miles of paved alleys, 1,350 of unimproved; a total of 5,150 miles of streets and alleys. It has 1,350 miles of street railways, with a daily passenger traffic of over 3,050,000.

SOUTH BEND FLUSHER UNIT USED IN CHICAGO

In common with that of other cities, Chicago's street-cleaning problem has greatly changed during the past 24 years. In 1911 the city's License Bureau showed 73,226 horses and 13,944 motor vehicles, as against 26,321 horses and 296,441 motor vehicles at the present time. It is not, therefore, so much a problem of the removal of heavy dirt as of an opportunity for cleaning the streets at all. Much time and intense study are given to the regulation of automobile traffic. Stringent ordinances and laws are passed in an attempt to safeguard human life, facilitate travel, and promote the interests of the business public.

As automobile traffic increases, street cleaning in like ratio becomes more difficult and increasingly greater in cost. Seventy-five per cent of street dirt on the pavement finds its way to the gutters within a few hours. The demand for clean streets and the removal of snow constantly grows more insistent, but with all the thought and care given to traffic regulation no account has been taken of the increased difficulty of street cleaning. If this branch of service is to continue to function, regulations must be made to furnish it with the opportunity.

The motorization here presented includes flushers and sweepers, truck-tractors, trailers and crawler-tractors, snow-plows and loaders.

Flushers

Flushers are used to supplement the work of the cleaning forces by washing the dust and fine dirt from the pavements. The down-town or "Loop" streets and those of the congested districts are flushed nightly. The main thoroughfares, business and traffic residential streets are flushed tri-weekly, others less frequently.

The city has twenty-eight 5-ton flushers of 1,500 gallons capacity; twenty Super trucks with South Bend double units, ten bought in 1922 at $7,500 each, and ten in 1923 at $6,955 each; seven Mack trucks equipped with Hvass single flushing units, purchased at a cost of $9,000 each; and one Packard with South Bend double unit, $7,580. The life of the flusher is estimated at 100,000 miles, and is discounted from year to year on a basis of mileage traveled.

Twenty-six of the flushers are operated in double shifts of 8 hours each, between 12:30 P. M. and 6:30 A. M. The remaining two are held in reserve to replace any that may be temporarily out of commission. Fifty-two crews of chauffeur and helper each are required to man the twenty-six flushers in daily use. Chauffeurs receive $7.50 per 8-hour shift, helpers $6. These twenty-six flushers travel 1,104 lineal miles and flush 11,925,296 square yards daily.

The Mack single unit averages 18 lineal miles per shift, consuming 2 quarts of oil at 12 cents per quart and 12 gallons of gasoline at 15¼ cents per gallon, making a cost of $2.07 for oil and gasoline. The Packard and Super double unit average 22 lineal miles per shift, consuming 2 quarts of oil at 12 cents per quart and 15 gallons of gasoline at 15¼ cents per gallon, making a cost of $2.53 for oil and gasoline. All models operate with 40 pounds pressure on the stream. For the year 1923 the cost of operation of the Mack single unit, including oil, gasoline, grease, shop, labor, parts, tires, depreciation, chauffeurs and helpers, averaged $1.17 per lineal mile; that of the Packard and Super double unit, 88 cents per lineal mile. The cost per 1,000 square yards was 8 2/5 cents.

It has been ascertained through observation and accurately kept records that the double unit not only gives better results in operation because of ability to control the stream regardless of the speed of the truck, but is to be preferred because of its economy. The double unit flushes, on an average, 4 more lineal miles of pavement to a shift than the single, with only 3 more gallons of gasoline and using 30 tanks of water, as against 28 with the single. The single unit runs on second speed when flushing; the double unit on high speed.

On car-line streets of 50-foot width or less, one trip is on each half of the street. On the first, which includes the center between the innermost car tracks, three nozzles are used on the single-unit type and two on that of the double. On the return trip two nozzles are used on both models. On residential streets the full width of the pavement is flushed in one operation.

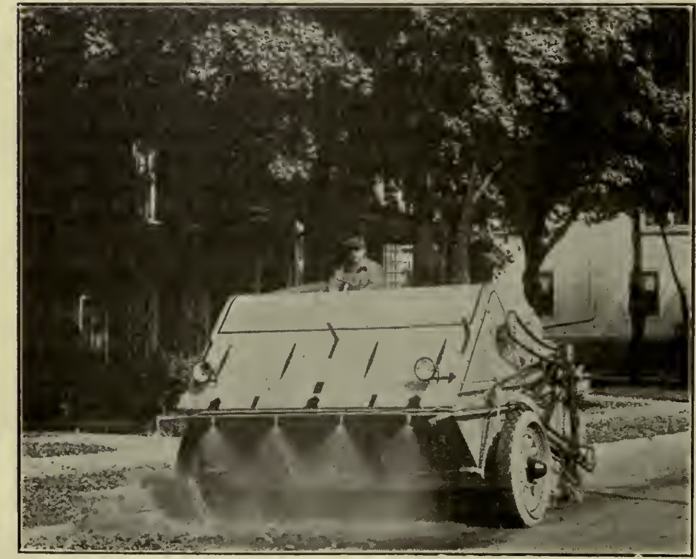
On the flushers of the single unit the four nozzles are trained to the right of the direction traveled, good results not being obtained otherwise. The nozzles on the double unit are arranged to flush on either side of the street or both sides in one operation.

If the present plan is carried out, twenty-two flushers will be added during the coming two years, making fifty in all. This number will be sufficient to care for the city's needs in this respect.

Sweepers

Chicago has eleven Elgin motor sweepers. Ten are used daily and one is kept in reserve for emergency. They are used for the most part in the outlying wards, where they are less liable to be handicapped by the parking of automobiles. The machines spray, clean the gutter, sweep the street, and pick up the dirt in a single operation. They average 5 hopper loads of dirt of 2¾ cubic yards each, consuming 10 gallons of gasoline and 2 quarts of oil in an 8-hour shift. The machine has a speed of 6 miles per hour. The rotary broom has two speeds. For heavy work the machine is operated in second speed and the broom in fast with a maximum flow of water. For light sweeping the machine is operated in high speed and the broom in slow.

Due to our immigration laws, which restrict the class of labor that sought and was adapted for this service, there has resulted a growing scarcity of good, available men and a greatly increased rate of wage. Realizing, therefore, that cities would be forced to seek other and more efficient methods, Chicago has adopted mechanical equipment for street cleaning.


AN ELGIN STREET SWEEPER USED IN CHICAGO

Tractors and Trailers

The motorization of Chicago's refuse collection equipment was begun in 1922. During the preceding years, the inadequacy of the city's method of collection in dilapidated wagons, the excessive cost of refuse removal by hired trucks, the increasing length of haul to dumps, and the advancing cost of operation led the City Coun-

WARNER SIDE-DUMPING TRAILERS USED FOR RUBBISH COLLECTION

cil and Street Bureau officials to seek an improved system. They investigated the use of the tractor and trailer system in other cities and were convinced that this would give satisfactory service at less expense. They therefore made appropriation for partial installation of this system. As these vehicles were for an entirely different activity from that of those previously used, the Council departed from its established policy of standardization and authorized the purchase of one 5-ton truck from each of the following companies: .

Kelly Springfield Motor Truck Company....	$4,414.60
Illinois Auto Truck Company (Super)......	4,800.00
Packard Truck Company..................	4,836.70
International Harvester Company...........	5,092.00
Garford Motor Truck Company............	5,307.00
The White Company.....................	5,768.39
The H. Paulman & Company (Pierce Arrow)	5,913.83
International Motor Company (Mack).......	6,224.73
	$42,357.25

In this way the city would be afforded opportunity for experimenting and deciding which tractor-truck was adapted to its needs.

Likewise, in the selection of trailers several types were chosen, as follows:

6 Detroit (knuckle type) reversible trailers @ $1,549.00 each	$9,294.00
12 Troy (knuckle type) reversible trailers @ $1,745.00 each	20,940.00
21 Highway (knuckle type) reversible trailers @ $1,595.00 each.....................	33,495.00
6 Trailmobile (knuckle type) reversible trailers 3 @ $1,238; 3 @ $1,438............	8,028.00
18 Warner (wagon type) non-reversible trailers @ $1,617.50 each..................	29,115.00
6 Automotive (wagon type) non-reversible trailers @ $1,450.00 each..............	8,700.00
12 Hvass (wagon type) non-reversible trailers @ $1,725.00 each......................	20,700.00
	$130,272.00

Since the installation of the trial trailers purchased during the summer of 1922, foremen of the dumps, superintendents of collection and equipment, engineers and officials of the Bureau, have made careful investigation of their operation and efficiency as contrasted with the old method of team and motor-truck haul. Reports from all are favorable to the tractor and trailer system. Their investigations have convinced them that two types of trailers are adapted to Chicago's needs, namely, Highway Trailer Company's and Albright & Company's Warner, 5th-wheel, non-reversible, 4-yard water-level. These trailers travel straight in train, are sufficiently light, yet strong and durable in collection of refuse in unpaved alleys, stand the severe test of soft, wet dumps, and seldom need repair. In accord with this finding, 80 of the Highway at $1,595 each and 79 of the Warner at $1,535 each were purchased at a cost of $248,865.

As no appropriation was made for the purchase of tractor trucks and the city was hiring trucks at the rate of $32.50 per day, the International Motor Company proposed furnishing them on a rental plan, and stated when an amount equal to the cost price of the truck had been paid, the equipment would become the property of the city of Chicago.

This plan was accepted and 25 Mack trucks were placed in service in August, 1924, to be paid for on the deferred payment plan of $400 per month for each truck, payments to be continued until $6,100 per truck is reached. A contract for 25 additional trucks was recently given to the White Company, the lowest responsible bidder.

The initial installation of the tractor and trailer system was made in six of the fifty wards into which the city is divided, one on the south side, two on the west, and three on the north. Four of the wards were selected because their respective ash and refuse teams were able to make but one load a day, the dumps available for disposal being from 8 to 9 miles distant. This made the cost of collection almost prohibitive. In the case of two wards chosen for experimental purposes on short hauls, the distances to their respective dumps were 3 and 5 miles.

There are in the six wards, eight tractors and trailer units, one tractor and three trailers in active operation, forming a unit or train. To each unit there are three, and in certain wards six, trailers in reserve in order that collection may not be interrupted while tractor and train are in transition.

The tractor-trailer trains make from five to six trips daily on the 3-mile haul, four trips on the 5-mile, and three on the 8- or 9-mile haul, traveling in the last instance a total mileage of from 48 to 54 miles daily. The tractor picks up the trailers from their collection districts or from a central point to which the trailers have been brought for that purpose. Where conditions permit, the tractor hauls the trailers into the dump, but where this is impossible, by reason of a bog-like condition, Caterpillars bring them in. The tractors are manned by a chauffeur and a conductor or helper. The trailers are horse-drawn, manned by a driver and a helper and operated in specific districts. Three to five loads are collected daily. The trailers have a water-level capacity of 4½ cubic yards. The loads are heaped and receive a credit of 6 cubic yards at the dump. The engineers state that they carry more nearly 7 than 6 cubic yards.

While a statement showing standardized cost of operation, maintenance and repairs cannot yet be made, it can be reliably stated that the unit cost of collection and disposal is materially lower than by any other method employed to date in Chicago.

Based upon the test of the past year with 8 tractors and 81 trailers, the city officials and engineers estimate that 142 tractors and 1,020 trailers are needed to cover the area within the city limits. The cost of these vehicles is placed at $2,342,000. Supplementing them, the city would still employ 452 teams to collect from the unimproved alleys of the city. With that equipment, it is estimated that a large saving would be effected. As previously stated, the city is purchasing 25 tractors and 159 trailers, and it is desired to install the complete service.

Last year the collection of ashes and refuse cost $2,570,190 and the hauling of garbage $638,123—a total of $3,208,313.. It is estimated that the same service in quantity, but considerably better in character, could have been rendered by the tractors and trailers for $2,490,810, thereby effecting a saving of $717,503. From this estimated annual saving of $717,503 alone, all the tractors and trailers required could be paid for in about three years.

Crawler Tractors

The use of the crawler tractors on the city dumps began in an experimental way. An appliance unique to Chicago, termed a "bulldozer," had been used in pushing ashes and refuse over the edge of the abandoned stone quarries and reclaiming land along the lake front. The appliance was in the nature of a road scraper projected at the end of a long pole and balanced on a two-wheel axle. A team was hooked to the whippletree and when driven pushed the refuse in front of the scraper into the fill.

The crawler tractors were tried in place of the horses; first, a 2½-ton tractor, then a 5-ton and later a 10-ton machine. It was found to be necessary frequently to pull mired loaded trucks out of the mud, requiring additional reserve power. The 10-ton crawler tractor was found to meet all requirements, and was adopted as standard. The crawler tractors are also used in pulling trailer trains into dumps when roadways are soft and wet. The city now has one 2½-ton Cleveland, five 5-ton and three 10-ton Holt Caterpillar tractors. The 10-ton Caterpillar tractors consume 23 gallons of gasoline and 4 quarts of oil each in an 8-hour shift.

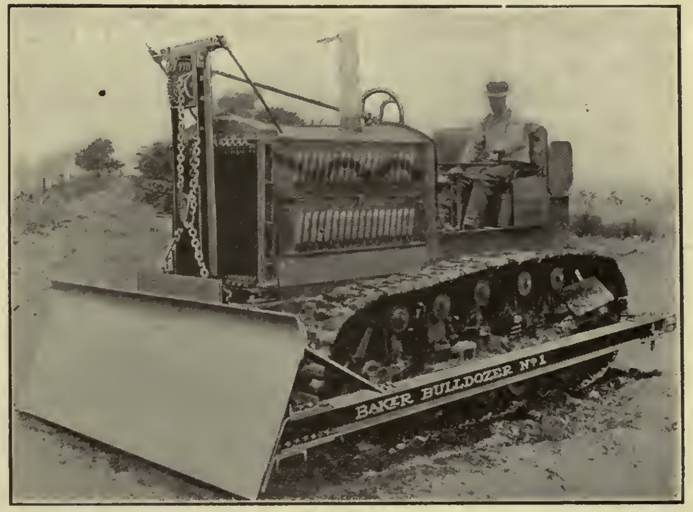
Snow Removal

The territory covered in snow removal comprises the congested down-town business region or "Loop"; the wholesale, warehouse, market and commission house districts; the railway terminals; and the main arteries and car-line streets leading to the "Loop." It includes also the principal streets of practically all the business centers of the fifty wards into which the city is divided. Along the street railways of the city where the snow is not cleared from the pavements, it is removed to the extent of 50 feet where passengers get on and off, and from the entire intersection at prominent transfer points. Attention is also given to the removal of snow from in front of churches, schools and buildings generally where persons gather in large numbers. Newspapers are scanned for burial notices so that snow may be removed from places where funerals will take place.

Since the winter of 1918, which in snowfall and severity broke all records for the Chicago region during the existence of the Weather Bureau, the fall of snow has been greatly below normal. The depth of fall for the winter of 1923-24 was 26.9 inches.

The mechanical equipment used in snow removal comprises plows, trucks and loaders. The snow is disposed of along the river front, in large sewers and vacant lots.

The Bureau of Streets has 25 snow-plows of the Champion and Baker makes. These are attached to the front of its street flushers.



A TYPE OF SNOW-PLOW USED WITH HOLT TRACTORS IN CHICAGO

They are started when the snow has reached a depth of about 1½ inches and are operated continuously thereafter until the streets included in the schedule are cleared. This places the snow in windrows ready for removal during and after the cessation of the storm. On many through-streets the environment of which does not require the removal of the snow, the plows clear the pavements for traffic. They are operated in batteries of two and travel at two speeds, from 4 to 6 miles per hour.

The snow is removed by trucks hired from contractors and firms at the rate of $32.50 per day of 8 hours. The trucks are loaded by hand, by the Barber-Greene snow loaders, and by clam-shell derricks mounted on trucks. Only once during the last winter was there sufficient snow to make the use of the loaders practicable, and as this snow fell during a mild temperature, making it nearly slush, followed by a zero drop, it did not furnish a favorable condition for their operation. In December, 1920, Chicago made an initial test of the Barber-Greene snow loader. It ran 32 hours continuously without a breakdown. It averaged more than 3 cubic yards per minute, although the snow had not been plowed or piled. In its operation a loader requires the services of an engineer and a helper, and two laborers at the plow end. It is self-propelled, self-loading, and end-discharging. It has a plow on either side of the conveyor belt, gathers the snow from the pavement and places it on the conveyor, which loads it onto a truck moving in the rear of the loader. It is operated by a Buda gas engine which consumes less than 12 gallons of gasoline and about 1 quart of oil in an 8-hour shift. The city has four of these, bought at a cost of $4,900 each.

The clam-shell derricks proved of value during the past winter, loading an 8-yard truck in about 3 minutes. They are operated by a separate motor from that of the truck. Six of these were employed, being hired from a contractor at the rate of $5 per hour.

The congestion of the streets is a great hindrance to the use of mechanical loaders, the hours from midnight to early morning being the only time when they are comparatively free from traffic and parkings. As these are the hours when it is practically impossible to secure labor and yet when conditions are most favorable for removal, the loaders have exceptional value. Under favorable conditions there is great economy in the use of mechanical loaders over that of laborers with scoops.

Extent and Cost of Snow Removal

During the period from January to the end of March, 1924, 55,889,487 square yards of pavement were cleared, 311,969 cubic yards of snow being removed. The cost of removal, including labor and motor vehicles, was $306,724; the cost of cartage being 34.4 cents per cubic yard.

ACKNOWLEDGMENT.—From a paper read before the American Society for Municipal Improvements, at Boston, Mass.

New White Way in Abilene, Texas

SEVEN miles of streets in Abilene, Texas, a town of 15,000 inhabitants, have been equipped with a new modern street-lighting system, using ornamental standards. The West Texas Utilities Company, which furnishes power to Abilene, made the installation. There are 483 single-light standards and a few bracket types for special places. In the business district, the Union Metal poles mounted on concrete subbases are placed six to the block, opposite each other. In the residential section, there are three to the block, in staggered formation. The lighting units are G. E. Novalux fixtures with rippled alabaster globes and rippled canopies.

Civic Changes and Growth Demand That Local Transportation Keep Pace

By John A. Beeler

Director, The Beeler Organization, Public Utility Consultants, New York City

DURING the development of any growing community, civic changes occur from time to time that have a material effect on the local transportation system. These changes may result from municipal or industrial activities or from other causes. The traveling habits of the population are changing, and traveling facilities must be revised to accommodate them. Among other things, a traffic survey is essential to determine the proper type or types of coordinated local transportation and to specify the routing, quantity, quality, and type of service required to best serve the community. It is now generally recognized that local transportation, efficiently and economically rendered, is most essential to the social and commercial welfare of any first-class community.

REROUTING AND OPERATING SURVEY OF TRACTION SYSTEM SERVING 200,000 POPULATION

Revenues and Expenses	Old Plan (Actual)	Revised Plan (Estimated)
Operating revenue.....	$2,670,400	$2,670,400
Operating deductions...	2,179,000	1,927,000
Net revenue..........	491,400	743,400
OPERATING COMPARISONS		
Miles of track operated.	83.8	83.8
Number of cars in service	195	172
Car-hours	910,500	735,000
Car-miles	7,500,000	6,420,000
Car-miles per car-hour.	8.22	8.74
Operating revenue per mile of track.......	$31,900	$31,900
Operating revenue per car-hour	$2.94	$3.64
Operating deductions per car-hour........	$2.39	$2.62
Net revenue per car-hour	$0.55	$1.02
Operating revenue per car-mile, cents	35.6	41.6
Operating deductions per car-mile, cents..	29.0	30.0
Net revenue per car-mile, cents.........	6.6	11.6

Population Centers Shifting

Population centers are shifting. New sections may rapidly outstrip older ones. Business centers are moving in many cities. Take New York, for instance, where the principal retail section has been steadily climbing uptown. A few years ago it was at 14th Street; then 23rd Street; then 34th Street; now 42nd Street, and pressing on towards 57th Street. Chicago has at last broken through the ironbound Loop and is fast flowing northward along the new Michigan Boulevard. Similarly, in many other cities the movement of the principal business section is apparent.

New secondary business districts are developing in the more important cities. Apartment house construction is concentrating the population. Industrial developments, viaducts, bridges, tunnels, and boulevards are opening up and making available new districts. Enterprising realtors and progressive populations are creating new developments in many enterprising cities. The relocation of steam railroad terminals and stations and the construction of rapid transit lines all have a far-reaching effect on city development and its local transportation.

There are numerous instances where the principal railway station has been moved from the heart of the down-town district to an outlying district, with a great effect on the development of the city. A few years ago in a city of less than 200,000, the railway terminal was moved from the business district to a point two miles distant in a comparatively undeveloped section, creating much new development and new demands on the local street railway.

In other cities the electrification of steam railroad lines has caused important shifts in the population and great changes in the character of the adjacent residential and business sections. In the larger cities the construction of rapid transit subway and elevated lines has completely revolutionized former conditions. A subway, with express and local service, concentrates and develops new residential and business sections along its path. The surface lines, formerly serving the same districts, quickly undergo a transformation and, contrary to the expectations of many, after suffering a temporary slump, develop a new business.

The function of the rapid transit lines is primarily to move mass transportation quickly, and usually for considerable distances. The surface lines may lose the long-haul patrons, but in many instances they take care of an increased and more profitable short-haul traffic. For instance, in Manhattan when the four-track subway was constructed on Broadway north of 42nd Street, the surface cars operating on this thoroughfare suffered a diminution of travel temporarily, but to-day this line is one of the best in the city, showing earnings around one dollar per car-mile.

The construction of rapid-transit tunnels under the rivers around Manhattan has caused tremendous shifting on the adjacent shores from the old traffic channels to the new. This is illustrated by the fact that most of the business formerly done by surface cars in hauling immense crowds to the ferry lines has disappeared. There are as yet a few car lines operating heavy service to superseded terminals, while busses, in some cases paralleling the car lines in the main, are routed to the rapid transit terminals, much to the advantage of the bus.

Industrial development is usually a slow and steady growth. There are, however, a number of examples of excessively rapid development. The Ford plant is perhaps the most notable example of a score or more in Detroit. In Chicago, the Western Electric plant may be cited as an example of a considerable number of large industrial enterprises employing thousands of workers which have created problems for the local transportation system. The removal of the Baldwin Locomotive plant from the heart of Philadelphia to the suburbs is another example. A railway serving large industrials faces a huge and intricate problem in arranging service that will meet the demands satisfactorily and keep within the prescribed limit of costs. Unbalanced loading results either in non-productive or in inadequate service, either of which is a detriment to the company and the community.

Necessity of City Plan with Coordination of Transit and Traffic

Municipal improvements, such as the establishment of civic centers, parks, boulevards, viaducts, and transportation arteries under a comprehensive plan, may be used to shift or diffuse concentrated traffic, both public and private, from certain congested districts to thoroughfares where freer movements may be obtained. Hence the absolute necessity of providing for a comprehensive system of coordinated local transportation in any effectual city plan. The unprecedented increase in the use of the automobile in the past decade, while greatly stimulating the riding habit as a whole, brings new problems to the fore, such as fast vehicular ways by-passing this class of traffic around the congested district as far as practicable instead of through it.

In a community of less than 300,000, traffic checks showed that 330 street cars and 27,000 private automobiles were in active daily use last year. The passenger rides were 75,000,000 on the railway and 55,000,000 by automobile, making a total annually of 130,000,000 rides. From this it is seen that it required 80 times as many automobiles to care for but two-thirds as many riders as carried by the railway. This illustrates forcibly the absolute necessity of maintaining the local railway system in the highest possible state of efficiency, for, as it deteriorates, the growth of the private automobile is stimulated. This motor growth is now involving many cities throughout the country in street-opening and widening projects that are costing millions upon millions of dollars. Many such improvements are promptly usurped by the parking hog, thus largely neutralizing the benefits before they are obtained.

Not only does the street car conserve space in the moving lanes of massed traffic, but it requires no parking space. Cities must encourage and foster local transportation systems for the benefit of the community and to avoid excessive taxation. The crying need everywhere is for better public transportation. The cities to-day that are securing superior service are those that are the most prosperous and progressive.

Tractions must not be taxed to death, nor must special burdens be heaped upon them, as has been the tendency in the past. The elimination of such burdens will assist in keeping the fares at a minimum. The rates, however, must be sufficient to renew and perpetuate the equipment and plant, and maintain an up-to-date system. It is not the rate of fare that is most objectionable, but inferior service, which is dear at any price.

Developing Near-by Versus Outlying Districts

In a city of some 400,000 the fact was developed by analysis that a territory equaling one-quarter of the city's area, and housing one-half of the population, contained two-thirds of the car tracks, and that a newer district, housing the other half of the population and covering three-quarters of the city's territory, had but one-third of the trackage. Under these conditions the trolley service was neither satisfactory to the public nor profitable to the company. In order to correct this inequality and permit of the proper expansion of the community, a comprehensive rearrangement of the trackage, together with a radical change in the routing, was recommended.

On the other hand, too many cities have complacently allowed themselves to be overexpanded by enterprising realtors and others anxious to locate homes in outlying sections. This involves, in addition to car-line extensions, the expansion of the gas and water services as well as the sewer and paving systems of the community. It increases the costs of police, school, and all other city departments. Meantime, much close-in property stands vacant, representing practically a dead loss to the community.

Rehabilitating Non-Paying Traction Without Increasing the Fare

Recently an enterprising railway management in a western city made a survey of the vacant residence sites within easy walking distance of its car lines. It was ascertained that 24,000 such sites existed. It listed the properties by localities and inaugurated an energetic publicity campaign, using car, newspaper, and bill-board advertising. With the cooperation of the lot owners, the real estate men and the authorities, a demand was created for these properties and a building boom started. This enabled the railway to stimulate its more profitable short-haul business and reduce the pressure from those interested in outside developments, involving more non-paying lines. It also forcibly pointed out to the community the advantages of building up these inside districts before further expansion.

The desirability of bettering the present transportation methods and at the same time providing a comprehensive plan for future requirements by coordinating all the essential elements of public transit is now recognized more generally than ever before; in fact, any important community's commercial and industrial future depends largely upon good local transportation, both public and private. This need is the one big problem facing our larger cities to-day—and it is by no means confined exclusively to the big cities.

An example of the benefits of a survey in a community of 200,000 people is shown briefly by the comparison of a few essential operating figures on page 568. In this case the revised plan that was submitted and adopted, among other things, provided for more direct routing of the car lines, the elimination of duplication in service, and the distribution of the service more nearly in accordance with the indicated travel requirements. By minimizing delays and by relieving and avoiding congestion, the average speed of the cars was increased about 8 per cent, which is strictly in line with the best practice to-day. The revised plan also showed it to be practicable to increase the annual net earnings from $491,400 to $743,000. The latter figure capitalized at 7 per cent is $10,600,000; the former, $7,000,000. The difference, or $3,600,000, represents the financial value to the community in operating under the revised plan, for the public pays the cost in the end. At the same time, an improved service was given to the patrons and the railway made self-sustaining without an increase in the rate of fare.

An All-Community Problem—Racial Groups and Public Health

FROM various sections of the country come indications of greater community appreciation of the mutual dependence of racial groups on each other for better health. There is a growing realization of the fact that communicable diseases and epidemics do not draw color or race lines. Progressive public-health workers long ago recognized that if a community is to be adequately protected, a focus of disease must be eliminated, no matter which race harbors it. However, there still remains much to be done in developing this attitude toward the health of races in a community and also much to be done for the further reduction of morbidity and mortality rates among Negroes. At the present time the venereal diseases, tuberculosis, and various infantile disorders are still reaping a heavy toll among the colored people, and the influence on these conditions is bound to be felt more and more in the North as a result of the steady Negro migration from southern sections. The public-health problems of those northern industrial communities which are receiving the bulk of this migration, cannot avoid being complicated through this influence, particularly as students of the race problem predict that the migration is likely to continue for a long time.

With increased Negro populations and the attendant health problems, it is essential that the northern centers most affected by this influx should give increased study to the situation. It is important that these communities understand their problems sufficiently to advise ways and means by which existing agencies for the promotion of public health and social welfare may appreciate and meet them. Experiences in several communities show that good results may be secured by the development and the use of Negro personnel, this personnel to be given the advantage of working in those organizations already established for the handling of those conditions.

—From the October, 1924, issue of the *Journal of Social Hygiene.*

General Organization of City Paving Departments

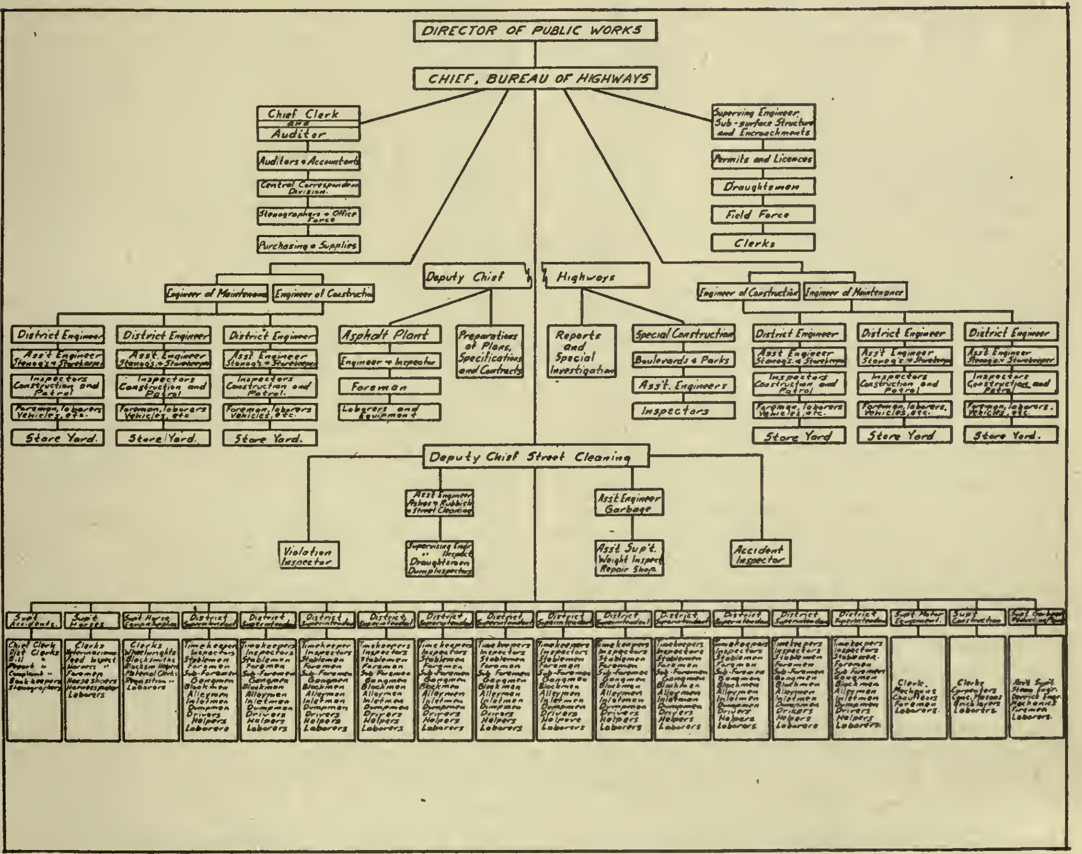
Abstract of Report of Conference Held at the Engineers' Club of Philadelphia

PHILADELPHIA, PA.

By J. H. Neeson, Chief, Bureau of Highways

THE highway organization in Philadelphia is divided into two functions—one of construction, and one of street cleaning. It is the largest metropolitan city that has an organization of this character. This came about, originally, owing to the fact that street cleaning and the collection and disposal of waste has been considered by engineers to be a function of street maintenance. Whether it is or not is a debatable question. With proper control, there would probably be little difficulty in handling it. As a part of a big system, as it has been in Philadelphia up to two or three years ago, it simply meant supervision, the supervision being supplied by the highway engineers and the inspectors under them—their only duty being to see that specifications were carried out in accordance with contract. But when the change was made from contract work to municipal work, it became a different proposition, because then the department was directly handling an organization of its own, involving about 3,000 men.

Considered from that standpoint, a division of street cleaning may become unwieldy and unmanageable; and, in connection with the functioning of the highway department there may be ground for contention as to whether it should properly be included. There are, however, other reasons why, from an engineering standpoint, we should consider street cleaning as a function of highways. There are certain related costs, certain related engineering reasons, why street cleaning should be


DIRECTOR OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS
Chief Clerk and Auditor
Auditors & Accountants
Central Correspondence Division.
Stenographers & Office Force
Purchasing & Supplies
Supervising Engineer Sub-surface Structures and Encroachments
Permits and Licences
Draughtsmen
Field Force
Clerks
Deputy Chief
Highways
Engineer of Maintenance
Engineer of Construction
District Engineer
Ass't Engineer Stenog's & Storekeeper
Inspectors Construction and Patrol
Foreman, laborers Vehicles, etc.
Store Yard.
Asphalt Plant
Engineer & Inspector
Foreman
Laborers and Equipment
Preparations of Plans, Specifications and Contracts
Reports and Special Investigation
Special Construction
Boulevards & Parks
Ass't. Engineers
Inspectors
Engineer of Construction
Engineer of Maintenance
Deputy Chief Street Cleaning
Ass't Engineer Ashes & Rubbish & Street Cleaning
Supervising Engr. Inspector Draughtsmen Dump Inspectors
Violation Inspector
Ass't Engineer Garbage
Ass't Sup't. Weight Inspect Repair Shop
Accident Inspector
Sup't Accidents.
Chief Clerk Dist Clerks Bill " Report " Complaint " Book-keepers Stenographers
Sup't Horses
Clerks Veterinarians Feed Inspect Harness " Foremen Horse shoers Harness makers Laborers
Sup't Horse Equipment
Clerks Wheelwrights Blacksmiths Blacksm. Helpers Material Clerks Requisition " Laborers
District Superintendent
Timekeepers Inspectors Stablemen Foremen Sub-Foremen Gangmen Blockmen Alleymen Inletmen Dumpmen Drivers Helpers Laborers
Sup't Motor Equipment.
Clerk. Mechanics Chauffeurs Foremen Laborers.
Sup't Construction
Clerks Carpenters Cem. Masons Bricklayers Laborers
Ass't Sup't. Steam Engr. Derrick Engr. Mechanics Firemen Laborers.

ORGANIZATION CHART OF BUREAU OF HIGHWAYS, PHILADELPHIA, PA.

considered a part of the maintenance of highways; but it is a question of such magnitude that it resolves itself into one of policy.

The highway unit has charge of the construction and maintenance of all city street paving and country roads; of boulevards and parkways; the maintenance of bridges, sewers and watercourses; the supervision of all matters affecting the use of public highways between building lines, and such incidental work as erection of buildings and development of city property areas as may be directed by special legislation.

The street cleaning unit now has direct charge of the operation of cleaning streets, including the removal of snow; the collection and disposal of ashes, rubbish and garbage by municipal forces; the construction and maintenance of buildings (stables, reduction and incinerator plants, garages and shops), plant and equipment.

The control of the combined units is vested in the Chief of the Bureau of Highways. The personnel of the Highways Division consists of 700 to 800 employees, comprising engineers of construction and maintenance; division and district engineers, assistant engineers, inspectors; street, road, bridge and sewer maintenance units; and the accounting and clerical forces. The Street Cleaning Division has on its roll 2,800 to 3,000 persons—assistant and supervising engineers, district superintendents, veterinarians, superintendents of plant and equipment, inspectors, accountants, timekeepers and clerks, and the force necessary for the daily collection and disposal of ashes, rubbish and garbage and the cleaning of streets. Each division is in direct charge of a deputy chief.

The Highway Division is responsible for maintaining and keeping in good repair over 1,600 miles of improved streets and road pavements, 1,100 miles of sewers, and 275 bridge structures; constructs new streets and roads (including grading and paving); repaves and resurfaces; constructs boulevards and parks; executes five hundred contracts annually and has control of the expenditure of approximately $7,500,000 of current and loan funds. The Street Cleaning Division cleans on definite schedules the above mileage of streets and roads; serves two million people in the collection and disposal of waste; operates a garage and a reduction plant; constructs new plants and equipment; provides for the up-keep of garages, stables and shops; maintains 1,800 horses, 800 pieces of horse-drawn equipment, and 125 pieces of motorized equipment, at a total annual outlay of current and loan funds of approximately $5,500,000.

The combined cash expenditures of the Highways and Street Cleaning Division range from $13,000,000 to $15,000,000 annually.

The organization of the Highway Division for construction and maintenance of streets and roads has been established for several years. It has never been found necessary to modify the method of its functioning, except for slight changes in procedure, since it was originally designed for strictly highway purposes. It is fundamentally sound in conception, being built to fit the geographical conditions of the city as well as to supply the proper amount of engineering supervision and control. It is sufficiently flexible to permit of such expansion as would be necessary to take care of a comprehensive program of construction work—mainly additional engineering and inspection service.

Construction practices, being standardized, are carried on in the subdivisions or districts under the direction of the Engineer of Construction, a similar procedure being followed on maintenance work of streets and roads under the Engineer of Maintenance, both of whom report direct to the Chief Engineer. The organization functions in such a manner that the Chief of the Bureau may engage himself with important administrative details while exercising control of the entire organization through his principal subordinates.

There has been a slight modification since its original conception, in that when the Highway Bureau was first organized on an engineering basis, twelve years ago, the functions of construction and maintenance were equally divided between two division engineers, the division engineers having charge of an allotted number of districts, the work being approximately equally divided between the two.

Changes made a few years later, probably six years ago, resulted in a modification of the organization to the extent of putting one engineer exclusively in charge of construction work over the entire city, and another engineer in charge of the maintenance work over the entire city. That is the principal change that has been made, but it also has resulted in a number of modifications and changes from the original, which are more or less automatic. By dividing the work between two division engineers, their various functions could be properly coordinated, but when that work was taken away and an engineer of construction and an engineer of maintenance instituted, it upset, to some extent, the original plan, and we have been operating under that latter plan for about six years. From an organization and an engineering standpoint, in my mind, the original plan was the better of the two; but we haven't reached the point yet where we are quite ready to return to it.

Our highway work is placed in charge of six district engineers, whose duties are to assume charge of the construction of new streets and roads and the maintenance of streets and roads. Under them are the various inspectors of construction and of maintenance. Each district engineering force acts as an individual unit, all coming directly under the Deputy Chief of the Bureau, theoretically, and operating from the main office in their general work.

The question of organization of a highway department, considered simply as a highway department, is one that we should wish to standardize; that is, so far as the work of this particular organization in every large city in the United States is concerned. But difficulties about that arise from the fact that by legislation, and sometimes by executive enactment, functions which engineers believe should come under the highway organization are given over to other bureaus. To cite one instance—the designing of streets and roads is allotted to a bureau of another department.

Undoubtedly, it is desirable to combine all the functions entering into the construction of a street or of a road, in one organization. Design should originate in the highway organization, and construction be carried out by it; and maintenance should be, as it is, of course, in all organizations, an essential part of the work. The ideal highway organization is the one that carries the responsibility for design, construction and maintenance, and the authority thereafter over all portions of the street, from house line to house line. There is considerable lost motion involved in the placing of one important function under one bureau and two others equally important under another. They should all be combined and carried out as a part of one unit. The maintenance of city pavements is comparable in responsibility to the construction; the highway department should control the street from its original construction until its limit of life has been reached.

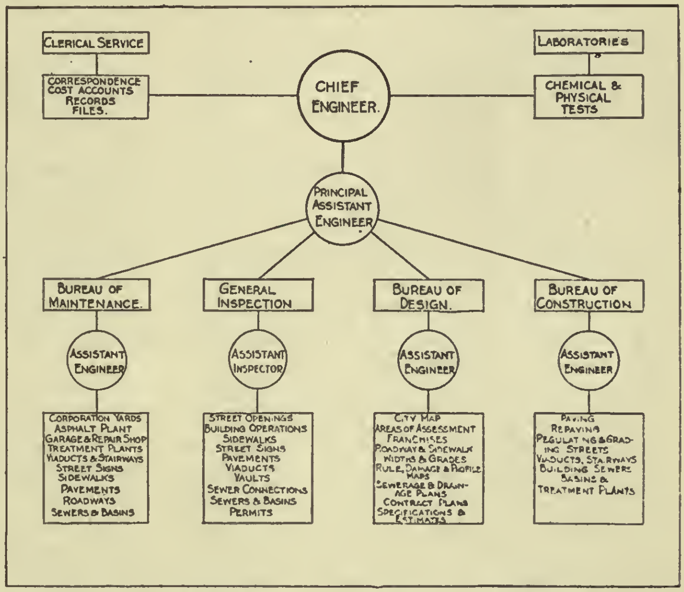

CLERICAL SERVICE
CORRESPONDENCE COST ACCOUNTS RECORDS FILES.
CHIEF ENGINEER.
LABORATORIES
CHEMICAL & PHYSICAL TESTS
PRINCIPAL ASSISTANT ENGINEER
BUREAU OF MAINTENANCE.
GENERAL INSPECTION
BUREAU OF DESIGN.
BUREAU OF CONSTRUCTION
ASSISTANT ENGINEER
ASSISTANT INSPECTOR
ASSISTANT ENGINEER
ASSISTANT ENGINEER
CORPORATION YARDS ASPHALT PLANT GARAGE & REPAIR SHOP TREATMENT PLANTS VIADUCTS & STAIRWAYS STREET SIGNS SIDEWALKS PAVEMENTS ROADWAYS SEWERS & BASINS
STREET OPENINGS BUILDING OPERATIONS SIDEWALKS STREET SIGNS PAVEMENTS VIADUCTS VAULTS SEWER CONNECTIONS SEWERS & BASINS PERMITS
CITY MAP AREAS OF ASSESSMENT FRANCHISES ROADWAY & SIDEWALK WIDTHS & GRADES RULE, DAMAGE & PROFILE MAPS SEWERAGE & DRAINAGE PLANS CONTRACT PLANS SPECIFICATIONS & ESTIMATES
PAVING REPAVING REGULATING & GRADING STREETS VIADUCTS, STAIRWAYS BUILDING SEWERS BASINS & TREATMENT PLANTS

CHART OF ORGANIZATION OF PAVING DEPARTMENT OF THE BOROUGH OF MANHATTAN, NEW YORK

The methods in Philadelphia for locating repair work are practically the same as they are in other cities. It is a function of the district forces, through their inspectors and the district engineers, to so supervise their work, or investigate their work and investigate the conditions of the streets, that repairs will naturally show or assert themselves at once. The great difficulty is in keeping up with the actual amount of work that is to be done. In other words, the program is never caught up with. While theoretically the organization for conducting maintenance may be sound and would work out properly, it is restricted and limited to the actual conditions under which it has to work—labor conditions, material conditions and funds available. So that while the maintenance of streets is, from the public standpoint, more important than the actual construction, it is very difficult to keep them in such condition that the public will be thoroughly protected and thoroughly satisfied.

BOROUGH OF MANHATTAN, NEW YORK CITY

By C. M. Pinckney, Chief Engineer

THE Bureau of Engineering is responsible to the Commissioner of Public Works for the construction and maintenance of all streets, street pavements, roads, highways, tunnels, stairway streets, sewers and sewer appurtenances in the borough of Manhattan, New York City, except those within limits of public parks.

The bureau has four divisions; i.e., inspection, Design, Construction, and Maintenance. The executive head of the bureau is the Chief Engineer, who has a chief clerk and a testing laboratory reporting directly to him. Each of the four divisions has an assistant engineer in charge.

The Inspection Division maintains a patrol system of the streets and furnishes a complete detailed report of the condition of every street in the city, including pavements, sidewalks, drainage, cuts. and all other matters for which the bureau is responsible. In other words, the Division of Inspection is the "eyes" of the bureau. All permits for the opening of pavement, and occupation thereof by builders, also for vault space, are issued by this division upon information furnished by its patrol section.

The Design Division is the creative branch of the bureau. It is engaged in the making of the city plan and changes thereto, and in the drainage system of the borough, and prepares all contract plans and specifications for sewers, paving and repaving work, sidewalks, viaducts, etc., and plant and equipment of all kinds for use of the bureau.

The Construction Division executes the contract work designed by the Design Division.

The Maintenance Division repairs pavements and sewers, cleans sewers and basins, restores all cuts or disturbances in street pavements, supervises the making of sewer connections, and has the general care of all public work for which the bureau is responsible. The labor work in this division is done by skilled asphalt workers, mechanics, sewer cleaners, bricklayers, etc.

The asphalt pavements in the borough of Manhattan are laid with a five-year guarantee, and from the date of their final completion and acceptance are under the charge of the Maintenance Division. At the expiration of the guarantee period the maintenance is assumed by departmental forces, and the material required is furnished by our own asphalt plant, which has a capacity of 4,000 yards a day. This asphalt plant supplies material for seventeen asphalt gangs, and during the months of June, July, August, September and October, four of these gangs are assigned to resurfacing asphalt pavements by the use of the heater method.

All granite pavements are laid with a one-year guarantee, and at the expiration of the one year, the maintenance is taken over by the departmental forces, and repairs are effected by seventeen granite gangs, who also repair the wood block pavements in the borough.

The sewer maintenance forces are divided into three groups—basin cleaning, sewer cleaning, and sewer repair gangs. Some of the basin cleaning is done by machine, and some by hand.

The foundations of pavements are repaired by regularly organized concrete gangs.

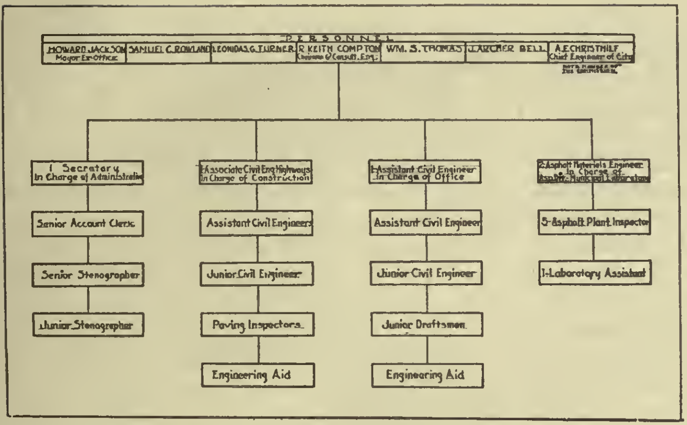
The engineer in charge of the Maintenance Division has reporting to him the superintendent of the asphalt plant, all general foremen in charge of a number of street gangs, the chief inspector representing the sewer activity, and the chief inspector representing the highway activity.

The testing laboratory is in charge of a chemist, and it is the function of that section to conduct all physical as well as chemical tests on all materials entering into the construction and maintenance of all public works under the care of the bureau. A representative of the laboratory is stationed at every place of manufacture, such as wood block treatment plants, asphalt plants and cement works, etc.

BALTIMORE, MD.

By George Cobb

In Baltimore there are three paving departments which function independently and at the same time cooperate rather closely. The first of these is the Paving Commission, created by act of the Maryland Legislature. It supervises the laying of new streets in the city. The second, the Maryland State Roads Commission, is authorized to expend from its yearly road allotment funds, 20 per cent on the paving of new streets in the city proper. The third, the Baltimore Highways Engineer Department, is responsible for the maintenance of all streets within the city limits. In each contract let under the Paving Commission, a clause provides that final acceptance of the work will not be made by the Commission until an inspection is made after an interval of six months, provided the expiration of the six months' period falls between May 1 and December 1. Otherwise the final inspection will be made immediately after May 1 succeeding the completion of the work. Upon acceptance of the work, the Paving Commission places it in the hands of the Highways Engineer for future maintenance. In the case of the Maryland State Roads Commission, work completed


PERSONNEL
HOWARD JACKSON Mayor Ex-Officio
SAMUEL C. ROWLAND
LEONIDAS G. TURNER
R. KEITH COMPTON Chairman & Consult. Eng.
WM. S. THOMAS
J. ARCHER BELL
A. E. CHRISTHILF Chief Engineer of City
1 Secretary In Charge of Administration
Senior Account Clerk
Senior Stenographer
Junior Stenographer
1 Associate Civil Eng Highways In Charge of Construction
Assistant Civil Engineers
Junior Civil Engineer
Paving Inspectors
Engineering Aid
1 Assistant Civil Engineer In Charge of Office
Assistant Civil Engineer
Junior Civil Engineer
Junior Draftsmen
Engineering Aid
2 Asphalt Materials Engineer In Charge of Asphalt-Municipal Laboratory
5 Asphalt Plant Inspector
1 Laboratory Assistant

ORGANIZATION CHART OF PAVING COMMISSION OF THE CITY OF BALTIMORE

under its supervision is immediately given a final inspection and then turned over to the Highways Engineer.

The Paving Commission operates under its chairman, who is also consulting engineer to the Commission. His principal assistant is an associate civil engineer, under whom a corps of assistant engineers supervise the contracts allotted to their several districts. Under each of these assistant engineers are inspectors and aides, who remain constantly on the sections of work in active operation. The drafting-room personnel, under an office engineer, reports directly to the chairman and consulting engineer. Likewise does the secretary to the Commission report direct to the chairman. Under the secretary come the clerical forces. The Commission operates a paving testing laboratory, in charge of an engineer, who also reports to the chairman direct. Under this engineer are asphalt plant inspectors—one located at the plant of each contractor in active operation—and laboratory assistants. The asphalt engineer is charged with the selection of proper materials and maintenance of correct mixtures. He makes daily trips to the operating plants and streets under construction and has analyses made of the materials and mixtures at each. The chairman maintains a system of daily reports whereby his street and plant forces render him an exact statement as to the yardage of paving laid and the total depth after compression. Once a week he holds a meeting, attended by all his engineers.

The head of the Maryland State Roads Commission is the chairman and chief engineer. He has an assistant chief engineer, who has under him division engineers, one of whom is assigned to each district in the state. The division engineers have their individual forces of inspectors and assistants. They supervise their work in its entirety, with the exception of sheet asphalt. When a state contract provides for the latter material, whether the work is to be done in the city of Baltimore, out of the yearly 20 per cent allotment of state paving funds, or anywhere in the state, the Paving Commission's laboratory is asked

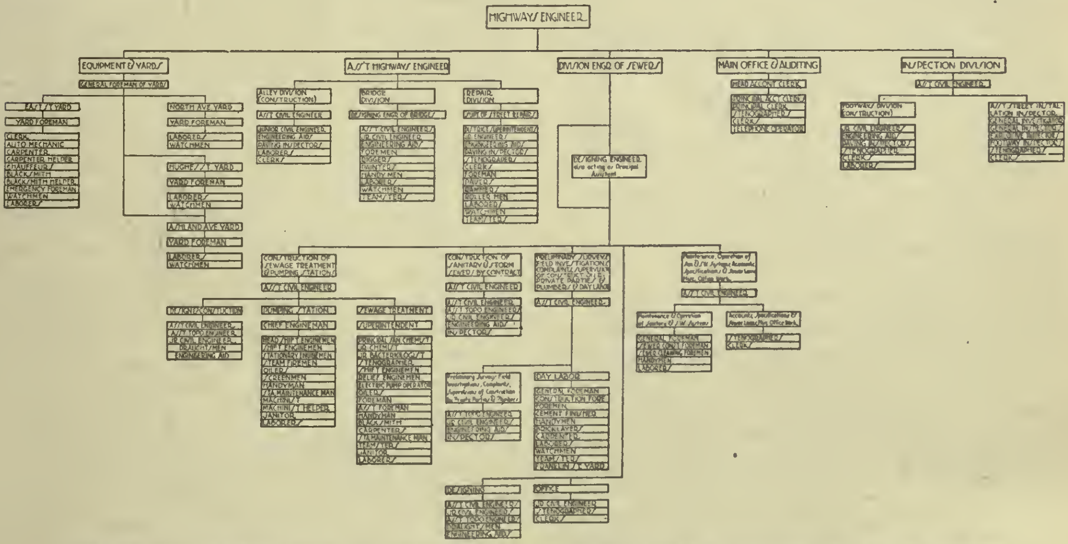


CHART OF ORGANIZATION OF THE OFFICE OF THE HIGHWAYS ENGINEER, BALTIMORE, MD.

to provide plant inspection. This arrangement, by mutual agreement of the State and Paving Commission chairman, has obtained for five years. For this service the State Commission pays at the end of the year to the Paving Commission a sum based on the prorated cost per square yard of all the paving inspected by the Paving Commission's laboratory during the year. In the selection of streets to be handled by the State Roads Commission, the Commission invariably follows the recommendation of the Paving Commission. The Paving Commission then lists these streets and acts as the intermediary between the State Roads Commission, city departments and public service corporations. When the utilities are completed, the release comes through the Paving Commission to the State Roads Commission, thus insuring close cooperation between the city and the state.

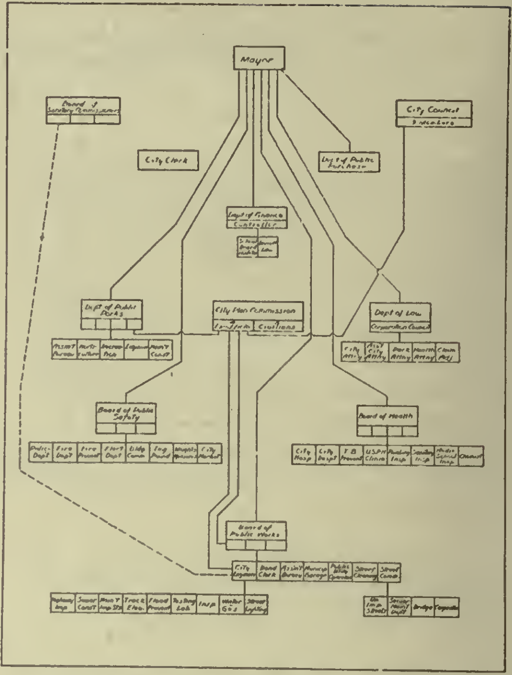
The Highways Engineer is in charge of the Highways Engineer Department. He has an Assistant Highways Engineer, who is directly over the superintendent of sheet asphalt repairs. This superintendent is in active charge of the paving inspection force. He assigns inspectors to the several paving zones into which the city has been divided. The zone inspector is held responsible for the proper laying of necessary repair work in his zone. A second assistant engineer, reporting to the Assistant Highways Engineer, is in charge of surface treatment work in the suburban areas. He directs his force of inspectors. As in the case of the State Roads Commission, the Highway Engineer calls upon the Paving Commission's laboratory for plant inspection and pays for the service.

Because of close cooperation, paving inspection costs are reduced to a minimum, each of the three paving departments benefiting proportionately. As an index to the efficiency of this system, it might be noted that in 1923 the amount of repair work relaid on bituminous streets in Baltimore, due to defective and worn-out paving, was 1.0 per cent. The paving involved covers four and a half million square yards, the oldest of which was laid in 1898.

INDIANAPOLIS, IND.

By J. L. Elliott, former City Civil Engineer

All street paving and maintenance is under the direction of the Board of Public Works, but under the direct supervision of the City Civil Engineer. The City Engineering Department prepares the necessary plans, specifications and resolutions for street paving, which are submitted to the Board of Public Works for hearing and contracts.



ORGANIZATION CHART OF THE ENGINEERING DEPARTMENT, INDIANAPOLIS, IND.

All construction work on new paving is done by contract under the direct supervision of the Inspection Department, which is a part of the City Engineering Department. The city of Indianapolis has its own maintenance department under the direction of the City Civil Engineer, which repairs and maintains all improved streets.

The Maintenance Department is under the General Superintendent, two assistant superintendents and necessary foremen, who are under the direct supervision of the City Engineer. During the summer months the city maintained two asphalt repair gangs, one emergency gang, two wood block and brick repair gangs, and one sidewalk and curb repair gang, each under a foreman experienced in the handling of the particular class of repairs.

The larger repair gangs cover the city from the repair yard to the city limits by gradual stages, making permanent repairs as they go. The emergency repair gang is used for emergency repairs which will not be reached by the repair gangs for a considerable length of time. The necessity for repairs is brought to the attention of the department by the Police Department and the Inspection Department. These requests are noted and necessary repairs scheduled by the Repair Department.

The city maintains an asphalt plant of approximately 1,200 yards capacity, with which all asphalt repairs are made. The brick and block repairs, to a great extent, are made by replacing worn brick and block with new construction. If the condition of the street is such that this replacement would cost more money than is justifiable, the street is then either resurfaced or patched with asphalt until resurfacing is accomplished.

WALTHAM, MASS.

By George C. Brehm

City Engineer and Director, D. P. W.

The engineering organization in Waltham, Mass., consists of a Department of Public Works, including streets, water, sewer, and engineering. All the city paving is done by our own forces, and we find it most satisfactory in every respect. The Street Division of the Public Works Department takes care of the construction and maintenance of streets and controls the street openings, etc., all of this work being handled by our own forces.

Practically all of our pavements are bituminous macadam, with a small amount of sheet asphalt. We have a gang constantly patrolling the streets, using the cold patch on the bituminous macadam streets for repairs, and the hot mix on the sheet asphalt streets.

American Counties Prevent the Blockading of Roads by Snow

Reports from Counties in the Snow Belt

FOR nearly ten years we have been talking of the need of snow removal on main highways to facilitate traffic 365 days a year. This need has been imperative with the increasing number of bus lines and of manufacturers who depend on highways for the distribution of their products. The reports from a score or more of counties throughout the United States, given below, show how completely reliance is now placed on automotive equipment for this kind of work. It must be remembered, however, that even the best automotive equipment is powerless to cope with a storm unless it begins to fight the storm the instant the snow begins to fall and unless it covers the ground frequently enough to prevent the drifting or packing of the snow.

Reports

Finney County, Kans.—Ben L. Allen, County Engineer, Garden City, Kans., reports that they are using Holt tractors and Baker V-type snow-plows to keep the highways open. In the winter of 1922-23 snow removal cost $1,365, and in 1923-24 it cost $1,158. The total snowfall in the latter winter was 14 inches, and the equipment was out seven days. Between 28 and 32 men were used in the snow-fighting forces.

Reno County, Kans.—W. A. Stacey, County Engineer, Hutchinson, Kans., reports that their mechanical equipment consists of two 10-ton Holt tractors, one 12-foot blade snow-plow, two 12-foot graders, and thirty 8-foot patrol graders. Six inches of snow fell in the winter of 1922-23 and 30 inches in 1923-24. The cost of removing the snow from the main highways was $1,200 the latter winter, and the equipment was out 8 days. Thirty men were used in snow-removal activities.

Sedgwick County, Kans.—M. Rosbury, County Engineer, Court House, Wichita, Kans., reports that one Baker plow on an FWD truck and one Baker V-type plow on a 10-ton Holt tractor make up the mechanical equipment for snow removal. The total cost of operation was $84 in 1923-24 for the removal of 15 inches of snow, and the equipment was out only 1½ days, using 6 men.

Wilson County, Kans.—C. T. Donald, County Engineer, Fredonia, Kans., reports that snow removal in Wilson County cost $1,851.68 in 1923-24.

Boone County, Iowa.—J. A. Illemay, County Engineer, Boone, Iowa, reports that snow removal in the winter of 1923-24 cost $1,310.

Buchanan County, Iowa.—O. L. Day, County Engineer, Independence, Iowa, reports that their mechanical equipment for snow removal includes a 10-ton Holt tractor, a 12-foot Baker straight-blade snow-plow, shovelers and patrol graders. Snow removal in the winter of 1923-24 cost $575.01, the equipment being used on 30 days and employing from 2 to 20 men.

Decatur County, Iowa.—Frank G. Mallette, County Engineer, Leon, Iowa, reports that their snow-removal equipment consists of crawler tractors and blade graders for light snow, supplemented by hand-power gangs for the heavy drifts. Snow removal in the winter of 1923-24 cost $641.

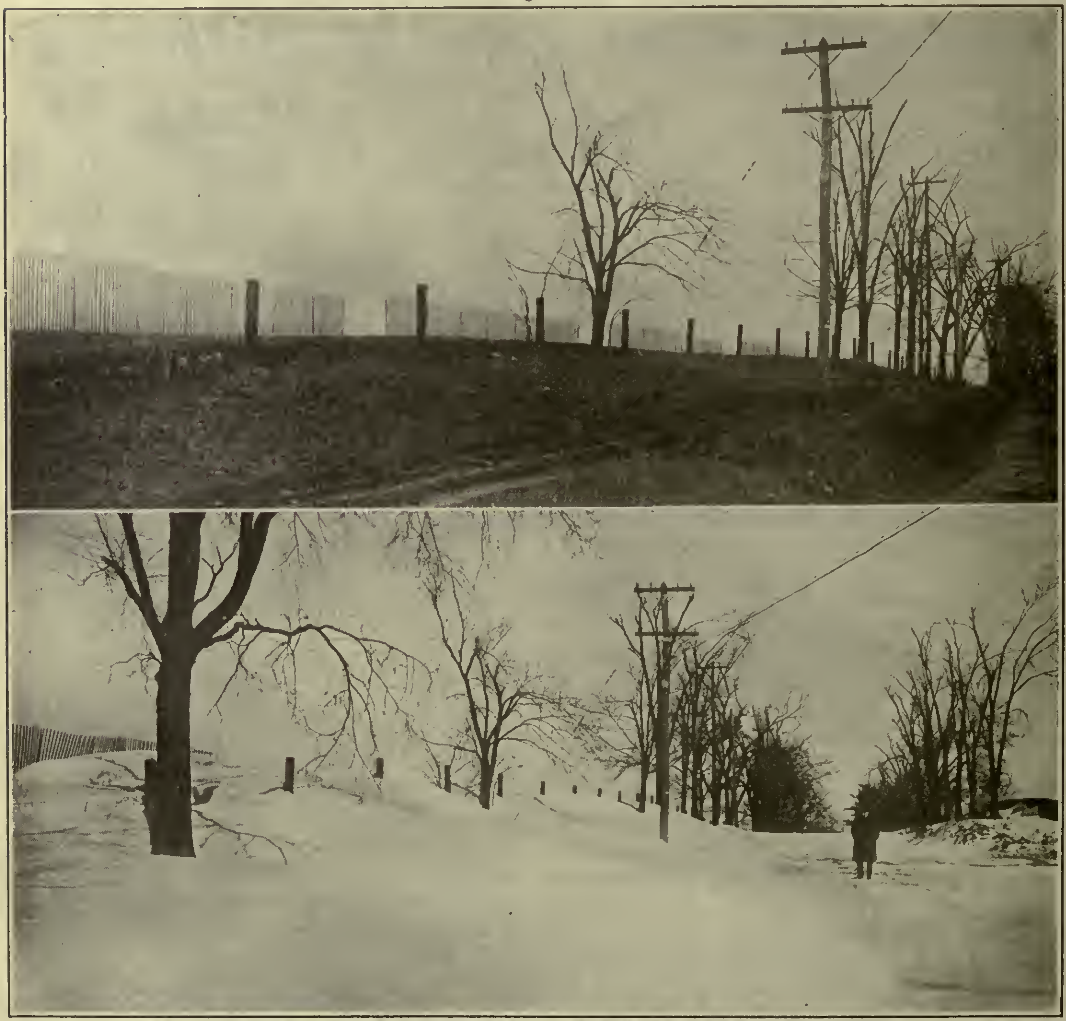
Keokuk County, Iowa.—W. P. Morris, County Engineer, Sigourney, Iowa, reports that their snow-removal equipment consists of one 10-ton Holt tractor and plow. The total snowfall was only 20 inches in the winter of 1922-23, and double that amount in 1923-24. The mechanical equipment was used on 10 different days last winter, costing $300 for operation and using from 6 to 12 men.

Marion County, Iowa.—Robert T. Johnson, County Engineer, Knoxville, Iowa, reports that teams with light graders and drags and one Holt tractor with grader are used for snow removal. The operation of these outfits cost $300 in the winter of 1922-23 and $400 in 1923-24. In the latter winter the equipment was used on 7 different days and 60 men were employed. Mr. Johnson reports that the rural population objects to snow removal because of misinformation sent out by local politicians.

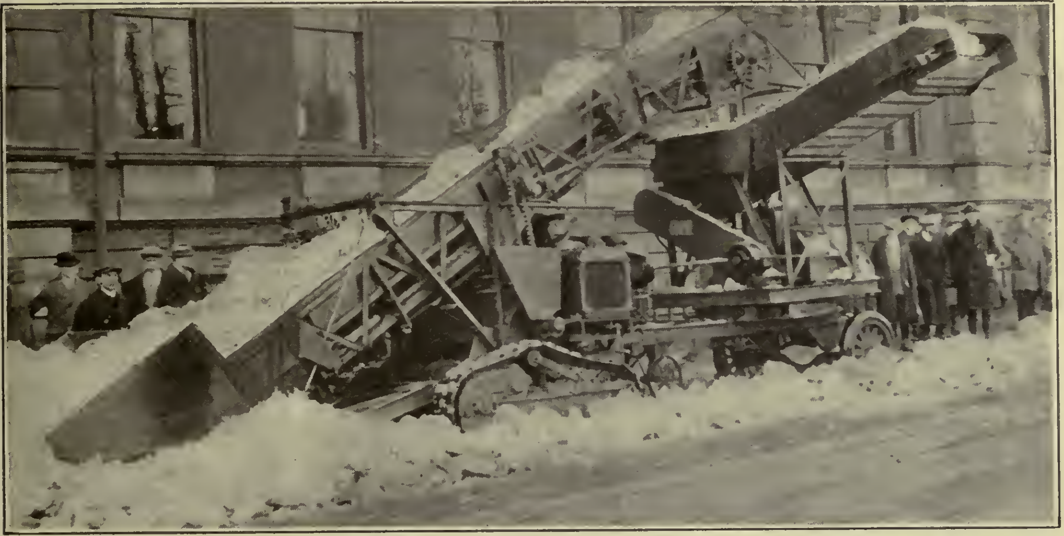
Palo Alto County, Iowa.—T. R. Martin, County Engineer, Emmetsburg, Iowa, reports that only hand shovels and blade graders are used for snow removal. The cost for removal was $800 in the winter of 1922-23 and $1,500 last winter.

Webster County, Iowa.—George Burnet, County Engineer, Ft. Dodge, Iowa, reports that shovels, fresnos, blade graders and snow-drags are used for snow removal. The operation of the equipment cost $2,500 in the winter of 1922-23 and $2,200 last winter.

Franklin County, Mass.—F. Deane Avery, County Engineer, Greenfield, Mass., reports



SNOW-FENCES PROPERLY PLACED MINIMIZE DRIFTS IN ROADS
At top—Wickwire Spencer snow-guard in place. Below—Drifted snow at side of roadway permitting highway to be used immediately after storms, with very little snow removal



A BARBER-GREENE SNOW LOADER EQUIPPED WITH A TRAILER FOR SIDE DISCHARGE IN USE IN BOSTON, MASS.

This machine made a record of 112 hours continuous loading, handling 7 yards in 45 seconds and an average of 1,600 cubic yards per 8-hour shift. The cost of hand loading was 47.3 cents per cubic yard before the machine was purchased, and with the machine only 7.6 cents per cubic yard

that the county does not handle snow removal, but that work is well taken care of by the town of Greenfield, which has a 10-ton Holt tractor and a Sargent plow, as well as two Fordsons and a Packard truck equipped with blade and V-type plows.

Dickinson County, Mich.—Paul Israelson, Engineer, Iron Mountain, Mich., reports that the county owns two 10-ton Holt tractors and one home-made snow-plow. The cost of snow removal in the winter of 1922-23 was $4,656.13 and in 1923-24, $4,929.87. The snow removal equipment was used on 65 days during the winter. The number of men employed in snow removal varied from 10 to 20 both winters.

Macomb County, Mich.—Walter J. Lehner, County Engineer, Mt. Clemens, Mich., reports that the county owns three Champion snow-plows for attachment to trucks. Snow removal in the winter of 1923-24 cost $1,500.

Washtenaw County, Mich.—A. R. Bailey, Engineer-Manager, Ann Arbor, Mich., reports that the county owns two Baker straight truck plows, two Champion straight truck plows, four Fordson graders and two Grand Rapids spring scrapers which are used for light work. The equipment was used 20 days during last winter and between 10 and 20 men were employed.

Lac Qui Parle County, Minn.—Fredrik Roe, County Highway Engineer, Madison, Minn., reports that the ordinary equipment of the patrolman constitutes the equipment for snow removal. The cost for snow removal in 1922-23 was $1,762, and for 1923-24, $1,142. During the earlier winter between 16 and 30 patrolmen were employed in snow removal, and last winter 23 were used.

Murray County, Minn.—J. A. Myron, Highway Engineer, Slayton, Minn., reports that the country relies on patrol graders, hand shovels and snow-fences to keep the highways clear. There has been very little trouble in the last three years with snow on the roads because the grades are built above the level of the surrounding country as much as possible and snow-fences prevent the accumulation of drifts.

Otoe County, Nebr.—H. C. Schwaderer, County Highway Engineer, Nebraska City, Nebr., reports that the mechanical equipment for snow removal consists of two 10-foot blades, one 12-foot blade, and one Baker snow-plow. Snow removal cost $350 in the winter of 1922-23 and $400 in the Winter of 1923-24. In the latter winter the equipment was used on 30 days, the number of men varying from 7 to 12.

Pierce County, N. Dak.—Herbert J. Bardell, County Surveyor, Rugby, N. Dak., reports that Pierce County's mechanical equipment for snow fighting consists of one Moline tractor and road blade grader, two teams, and a V-type snow-plow. The last two seasons the total snowfall has been 15 and 10 inches, respectively, and the equipment was used on 20 days last winter. The maximum snow-fighting force a year ago consisted of two teams and three men, and last winter of one man and the tractor.

Van Wert County, Ohio.—Otto Witten, County Surveyor, Van Wert, Ohio, reports that they have a truck and road grader for snow removal. The total snowfall in the winter of 1922-23 was 6 inches and last winter was 30 inches. The equipment was used 6 days last winter at a total cost of $500 and 30 men were employed.

Lawrence County, S. Dak.—Frank S. Peck, Superintendent of Highways, Deadwood, S. Dak., reports that their snow-removal equipment consists of a grader and Holt tractor.

Cowlitz County, Wash.—E. A. Middlebrooks, County Engineer, Kelso, Wash., reports that an old-fashioned split drag pushed by an FWD truck is used for snow removal on paved roads. The total snowfall has been only ½- and ¾-inch in the last two winters.

Pend Oreille County, Wash.—J. C. Stegner, County Engineer, Newport, Wash., reports that the highways are opened with Champion plows and trucks by state forces.

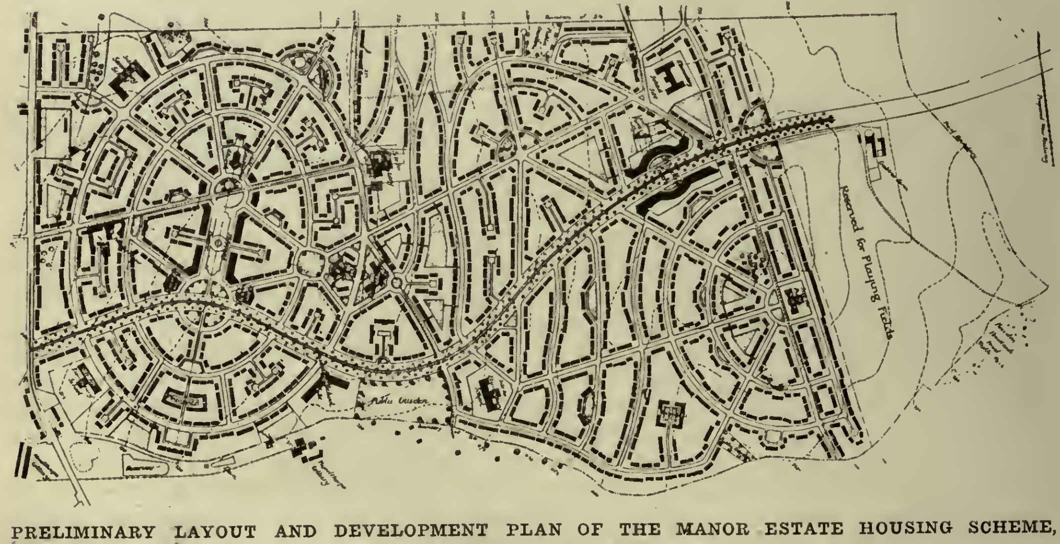
Trempealeau County, Wis.—Emil F. Rotering, Highway Commissioner, Whitehall, Wis., reports that several trucks are used for snow removal, which has cost $100 in each of the last two seasons. The snowfall has been 12 and 24 inches, respectively, and the trucks were used 4 days last winter, employing 5 men.

A Suburban Subdivision in Sheffield, England

IN the recently published report on "Sheffield: A Civic Survey and Suggestions Toward a Development Plan,"* prepared by Patrick Abercrombie and R. H. Mattocks, is given a list of the various suburban estates developed by the Sheffield Estates Committee, the area of each, and the number of houses so far completed.

The development of these estates has been carried out according to the following general scheme: houses at the rate of twelve per acre, and in groups of two, four and six; no separate back approach to the houses; a distance of between 60 and 70 feet between the backs and fronts of the houses; roads of varying widths to suit traffic needs, the purely residential needs being reduced to the minimum of street works; the use of decorative open spaces to relieve the continuity of houses, and other similar features.

One of the most interesting of these housing schemes is the Manor Estate, illustrated herewith, which is now in the early stages of its development. This is the largest scheme so far ventured by Sheffield, and includes the erection of 3,754 houses, 107 of which were completed at the time the report was published. As may be seen, the layout also makes provision for two shopping centers situated upon the section of the new Ring Road which traverses the site, and also for public buildings, schools, churches, playing fields, and public gardens. Such features as these have been included in all Sheffield schemes over a certain size; thus they are not mere tracts of efficiently planned housing accommodation, but are conceived as social units fitting into the life of the whole community.



PRELIMINARY LAYOUT AND DEVELOPMENT PLAN OF THE MANOR ESTATE HOUSING SCHEME, SHEFFIELD, ENGLAND

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* For a brief review of this report, see page 403 of the October, 1924, issue of THE AMERICAN CITY.

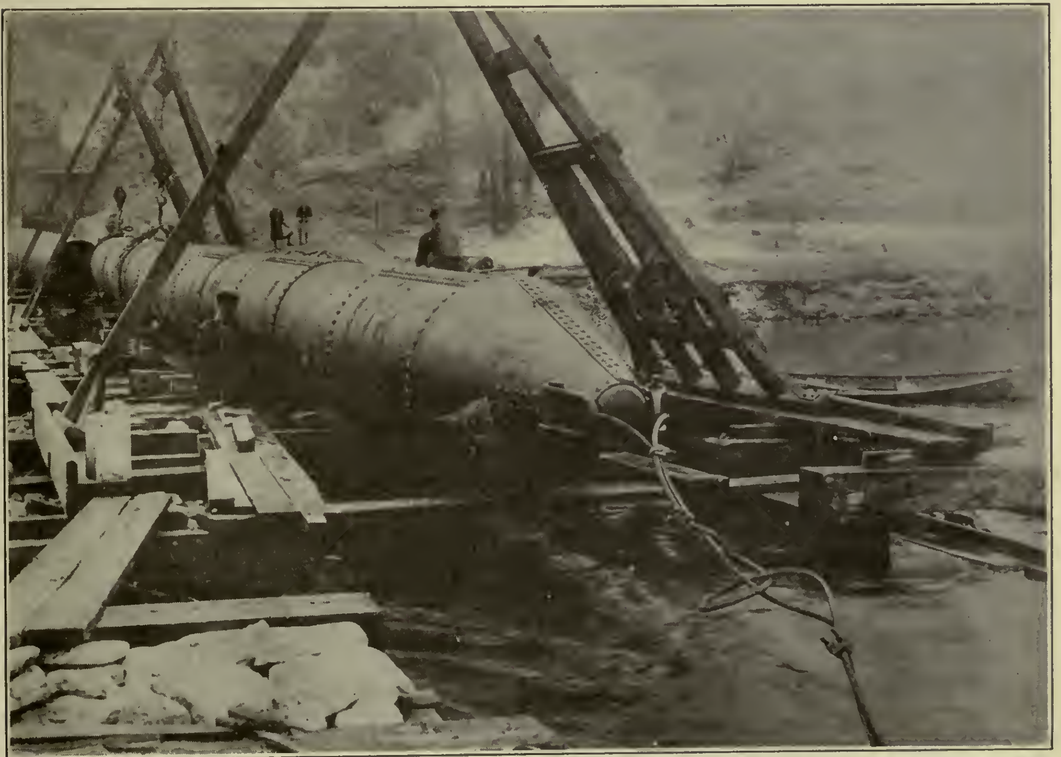
Laying a Subaqueous Water-Main at Minneapolis

Four-Foot Pipe Laid Across Mississippi River Under Difficulties

WHEN the Minneapolis water distribution system required the crossing of the Mississippi River just below the Falls of St. Anthony with a 48-inch riveted steel pipe ½-inch thick, the engineers were faced with a problem. The river at this point passes through a gorge some 900 feet between bluffs, which, on the east side of the river, reach a height of about 100 feet above low water and on the west side, 72 feet. On the east side there are 39 feet of sand and gravel to the Trenton lime rock; on the west side, about 11 feet from the top of the ground to the lime rock, which is of the same elevation on both sides of the river. This rock is 25 feet thick and separated from the underlying St. Peter sandstone by 3 feet of shale. The St. Peter sand rock is some 800 feet thick. The river has cut through the rock, and the river bottom is filled with broken débris of lime rock and boulders; at the deepest point about 40 feet, then the sand rock.

In order to make this crossing, 8-foot shafts were sunk on both sides of the river, and 8 x 7-foot tunnels extended from the shaft to the edges of the bluffs, 340 feet long on the east side and 60 feet long on the west side, and trenches were dug on the shores as far as possible. Work was started in January, 1923. As the current is very swift at all stages of water, it was necessary to do the river work proper in extreme low water, which occurs from the end of December to the middle of March, mostly in weather below zero. The problem was, how to excavate the trench in the material mentioned. Pile driving was impossible, and the water was too swift and shallow to permit the use of a dredge.

It was decided to build cribs 4 feet wide and 8 feet long, made of 10 x 12-inch timbers, with partly planked bottoms, each to be loaded with about 2 tons of rock. These cribs were



TORPEDO HEAD OF RIVETED STEEL PIPE HAULED ACROSS THE RIVER AT MINNEAPOLIS, MINN.

placed about 14 feet apart on centers across the river, and 16 feet on centers up and down the stream. On the cribs across the river, 24-inch I-beams 28 feet long were laid flat to form a running-track for the excavator, which was a stiff-leg derrick fitted with grooved wheels which traveled on 40-pound rails laid loose on the I-beams. The plan at first was to handle a ½-yard orange-peel bucket with this derrick. Before building the cribs, some excavating was done with this rig on the low shore on the west side, and it seemed as if the material could be handled that way. Accordingly, the placing of the cribs across the river was carried through and the runway completed from shore to shore.

The derrick was then sent back to the west end, and excavating operations continued with the orange-peel bucket, but as soon as the river was reached it was found that the bucket would not work satisfactorily at all, and the rig for excavating was changed by attaching to the boom of the derrick a dipper stick, placed about 20 feet from the end of the boom, with a ¾-yard steam-shovel dipper. The excavation with this machine commenced February 18, and the ditch was finished March 17. It was a very difficult piece of work. The material was exceedingly hard to handle; big pieces of ledge from earlier erosions were often encountered and they had to be dragged out. Some 2,500 yards of this stuff was excavated and dumped on the down-stream side. All small material was immediately washed away by the current, leaving the heavier stuff in place. As the excavation progressed towards the east side, the cribs were removed. I-beams were placed on the spoil bank as a track to carry the cribs, timbers and I-beams back to the west shore. These beams also formed the pathway between the excavator and the west side.

On March 21 riveting the 30-foot sections of the 48-inch pipe was begun, and on March 26 the work of pulling the pipe toward the east shore was started. The first section pulled had a torpedo-head to which a ⅞-inch plow steel iron-center pulling cable, fastened with Crosby clips, as shown in the illustration, was attached. This first section was 120 feet long. There were also two lugs on the inside of the torpedo head to which a ⅞-inch plow-steel cable was fastened with Crosby clips. This cable was kept anchored to the west bank. The pulling was done with an American hoisting engine through two sets of triple blocks. After the first section was pulled, 30-foot sections were added and pulled. On March 30, a total of 486 feet of pipe had been pulled out over the river, and another day would have landed the end on the east shore. However, luck was against the engineers in charge and on this very day the ice broke in the upper river—about two weeks ahead of the usual time—and a big ice gorge, which had formed about 15 miles above the falls, broke, releasing a flood of about 54,000 cubic feet per second, which is very nearly the maximum flood record on the upper Mississippi since 1860, when 60,000 to 65,000 cubic feet came down. The flood picked up the heavy pipe like a straw and laid it down-stream on the flat west shore, only shearing part of the rivets in one joint at about the middle of the pipe. The inside cable anchored on the west shore saved the pipe. A few days afterwards, ten million feet of logs broke away at Anoka, 18 miles from Minneapolis, and came down over the falls and cleaned out the spoil bank, I-beams and all. The beams were picked up later.

After such a series of mishaps, nothing could be done until the river went down again. In July the pipe was taken from where the flood had left it, straightened, joints repaired and tested, and placed in position for handling again under low-water conditions. Meanwhile, the work of building shafts and tunnels had gone on, and was completed on May 27. The shafts were lined with concrete and the tunnels with 6-inch vitrified tiling.

The flood had completely filled the ditch with sand, gravel and smaller boulders, and it was decided that the surest and best way to clean it out would be with a dragline excavating outfit. This was arranged as follows: The track cable was started from a 14 x 14-inch mast, 48 feet high, set up on the east shore. The elevation of the cable hitch was about 116 feet, the west end of the cable being fastened to a bridle cable subject to pull up or down stream, with a set of ¾-inch double blocks at an elevation of about 31 feet. The total span was about 980 feet. The track cable was 1¼-inch plow steel, the load line was ⅝-inch plow steel, and the tension line was ¾-inch plow steel. All fastenings were made with Crosby clips, and an American hoisting engine rated at 25 h.p., with a steam pressure of 125 pounds, was used with a ½-yard bucket. A 20-h.p. engine was placed on the west side. Setting up the cable and engine began September 11, and dragline excavation on the river proper began October 16, and was finished on the 20th of January, 1924.

On January 22 the pulling of the river sections of the pipe was begun again, and this phase of the work was finished on January 31. The last pull was about 15 feet of a total length of pipe of 698 feet. This, together with the constant wetting to which the cable and clips were submitted, furnished a severe test, which, however, showed the equipment well able to meet all requirements. As the pipe was pulled and sections added, water was let into it on the west end so as to keep it just about afloat above the bottom of the trench. It was gradually lowered into place from the west end, and closed in and riveted by February 9. On the east end, a coffer-dam had to be built over the pipe, to permit cutting off the torpedo-head, putting in the remaining sections and making connections with the end of the pipe at the mouth of the east tunnel. Much trouble was experienced in unwatering the coffer-dam, as sand rock was encountered inside the dam, and no puddle clay could be secured because of the extreme cold weather, about 20 degrees below zero at that time. However, the east end work was closed in on March 10.

As soon as the pipe had been properly placed, on February 12, the work of anchoring it started. This was done by placing very coarse fabric bags filled with sand and cement mixed 1:4 around the pipe, filling the entire trench in spots. Ten such anchors were placed, containing 18,000 sacks. The sand and cement were delivered at the top of the west bluff. The sand was heated and mixed dry with the cement in a small mixer and the sacks filled, slid down a plank chute, wheeled to the river edge, and then loaded on the dragline bucket, which was fitted with a platform large enough to hold twelve bags. The engine on the east bank pulled the bucket out over the pipe in the river, and the engine on the west bank pulled it back. As soon as the sacks had been thrown into place, holes were punched in them with sharp-pointed rods to speed up the wetting of the contents. The cement set satisfactorily, and the work was completed March 3.

On March 21 the entire work on the east side was completed and the coffer-dam removed. With everything ready, the expected flood came on April 4. The ice gorge broke about 14 miles above the falls and came down very violently, but without doing any harm to the main, and the débris carried by the flood water served to fill up the remaining open portions of the pipe trench.

ACKNOWLEDGMENT.—Text and illustration by courtesy of the *Crosby Clipper*, published by the American Hoist & Derrick Company, St. Paul, Minn.

A Study of the Value of Reinforcement in Concrete Roads

THE details of plan and procedure to be followed in the investigation of the economic value of reinforcement in concrete roads, being undertaken by the Highway Research Board of the National Research Council, are now completed and field examinations are about to commence. Director Charles M. Upham reports that the various state highway commissions will actively cooperate with the Board in conducting this investigation. Except in cases of actual failure, inspections will concern principally pavements having had at least five years of service, a great number of which are located in New Jersey, Ohio, New York, Pennsylvania, Delaware, Wayne County, Mich., Milwaukee County, Wis., Iowa, Illinois and California.

In this intensive study an effort will be made to determine, from a survey of existing roads, the influence of steel reinforcement on the resistance of the slab to traffic, subgrade, and climatic conditions; the conditions under which steel reinforcement is especially beneficial to concrete slabs; the effect of slab design on the efficiency of reinforcement; and, finally, the relative cost of plain and of reinforced concrete roads, considering the initial investment and the annual maintenance and renewal charges.

The procedure will consist of a personal examination of a sufficient number of existing road surfaces to cover different slabs, traffic, and climatic conditions. It is proposed to supplement the examination by photographs, sketches, soil determinations, and other available data. In each case, attention will be given to a study of the subgrade to determine its general characteristics and properties as well as the existing drainage conditions. In the case of the slab, a study will be made of original data to determine the materials and proportions that entered into the concrete, the method of construction that was followed, and the particular cross-section used. Careful note will be made of joints, cracks, replacement areas, and general surface conditions. The influencing factors of grade, alignment, location, and maintenance will be noted, and the matter of age, traffic, and climatic conditions will be given careful consideration. In the case of the reinforcement, a study will be made of the relative amounts of longitudinal and transverse steel, the method of treating reinforcement before placing, as well as its position in the slab. The form of the reinforcement will receive consideration to determine the relative values of fabric, rods, and other types in use. An effort will be made to determine the comparative value of hard steel and of mild steel for reinforcement, and the influence of continuous and non-continuous reinforcement. Wherever possible, the present condition of the reinforcement will be noted for breaks, rust, and other features of interest. Wherever obtainable, cost data will be secured covering the original as well as the maintenance investment.

Community Values in Christmas Seals

By Philip P. Jacobs, Ph. D.

Publicity Director, National Tuberculosis Association, New York

"PUBLIC education"—that is the big cry in these democratic days. And probably there has been no advance in any phase of education that counts heavier for individual and community betterment than the advance made in the ways of health. The realization of what sickness means in suffering, in sorrow, and in economic loss has resulted in intelligent and systematic organization and virile programs directed against all preventable illness.

One disease especially has been combated with great success, namely, tuberculosis. Five years ago a health demonstration was begun in Framingham, Mass., an average American small town, for the purpose of controlling tuberculosis. It was found that it cost approximately $2 per capita per annum to pay for an efficient public health program with special emphasis on the prevention of tuberculosis. But during the five years of the demonstration the death-rate from tuberculosis was reduced 67 per cent.

A $2 per capita health investment would cost a city of 25,000 population $50,000. It has been estimated that if tuberculosis could be eliminated as a cause of death, an average of 2½ years would be added to human lifetime. This at $100 a year net economic gain to the community—certainly not a high value for a person to put upon himself or herself—would mean a gain of $250 per person, or $6,250,000 to the community. This, of course, is not an annual gain, but a gain spread over the whole life span of the present generation of approximately 55 years. If we divide the $6,250,000 by 55, the annual gain will be well over $100,000 annually for the community—twice what the $50,000 investment in health would be. The saving in happiness for families and friends can, of course, never be estimated.

The laws for health that any community can follow are simple enough. Plenty of fresh air, nourishing food, a proper amount of rest and exercise, are the basic necessities of good health. Another important rule in the health game which should become a national habit is the periodic physical examination in order to keep track of the general condition of the human machine. We hear so much about overhauling automobiles, locomotives and turbines, but so little about overhauling our bodies. One hundred per cent efficiency depends as much on 100 per cent condition in the human machine as in any other.

Good health is, after all, the first essential to success. We have seen what poverty and disease following the war have done to several European nations. Our people are generally supposed to be fairly healthy, yet at the present time there are nearly one million active cases of tuberculosis and as many persons with the disease in an inactive state living among us.

The educational work of the National Tuberculosis Association and its 1,400 affiliated state and local organizations during the past fifteen years has helped to reduce the death-rate from over 200 per 100,000 persons to less than 100 per 100,000. Their desire is to control the disease through urging good health habits and periodic examinations. Hospitals, sanatoria, public health nurses, clinics where people may go for examinations, publicity of all kinds, and the training of children in the schools through the Modern Health Crusade are some of their media. The financial support of their work is derived from the penny Christmas seals sold annually in December.

City officials, such as mayors, city managers and heads of municipal departments, and also chamber of commerce secretaries and other executives of civic organizations can be of great assistance during the Christmas seal sale. Through understanding what the organized educational work can mean in the community, their personal interest and sympathy will go far toward influencing others to support the Christmas seal campaign. Not only can they purchase the seals, but they can get in touch with the local tuberculosis workers and lend in some cases really practical help, and in all cases most valuable moral support, to the cause. Further suggestions of ways in which to cooperate may be secured from the Association, 370 Seventh Avenue, New York.

Chamber of Commerce Activities in Public Affairs

City Planning—The City Practical

Plainfield, N. J.—Of the many municipal problems that have come to the writer's attention during his five years' experience as a chamber of commerce executive, the question of city planning seems to be subject to more misconceptions than any other. The average citizen and the average municipal official apparently think of city planning as something that has to do solely with beauty, and frequently that activity is catalogued as a more or less useless one.

As a matter of fact, city planning is one of the most practical ideas that a municipal government can adopt, and if it deals in any way with the city beautiful, it does so only through such beauty as naturally follows the execution of needed municipal improvements. Every city should adopt a city plan, whether the city be a growing, active municipality within a metropolitan area, or a non-growing community in an isolated territory.

About two years ago the Chamber of Commerce of the Plainfields appointed a committee to make a study of city planning. During the first year nothing was accomplished other than a study of standard literature on the subject. We failed to impress our municipal government with the fact that city planning is particularly useful, and there seemed no prospect of our making any progress in that direction. It so happened, however, that at the start of the second year of our city planning study, we discovered, through our usual workers' questionnaire, a new member who had recently become a resident of Plainfield, and who had been interested in and had had experience in city planning in two other cities. With the help of suggestions made by this newcomer, a program of necessary data was outlined, and it was then only a matter of a few months before the committee had mastered the basic principles of a city plan.

We realized that a city plan is a great coordinator of city government departments and the needs of a city. Our study pointed out that a municipal government cannot be economically operated unless all the needs of all its branches for a period of at least twenty years in the future are properly listed. It indicated that the right way to administer municipal government is to foster first such improvements as will benefit the greatest number of people at the most reasonable cost, rather than to execute improvements in accordance with political pressure exercised by small groups acting selfishly or particularly interested in some one project.

One of the first steps taken by the Chamber's committee was to ascertain the net debt of the city. The probable increase in assessed valuations each year was then estimated, and a table showing the amount of bonds that would be retired yearly was compiled. As a net result, we learned the approximate amount of capital expenditures that could be made during the next sixteen years.

In our preliminary city planning report* we catalogued what we believed to be the requirements of the various city departments over a period of years. It is evident, however, that the complete fulfillment of these needs would necessitate an expenditure several times greater than the amount of money that will be available for such purposes. The next step needed in this city, therefore, is the appointment of a permanent official city planning commission, whose responsibility it should be to devise a final, workable plan, based on the data already compiled by the Chamber's unofficial committee.

WILLIAM H. PFAU,
Secretary, Chamber of Commerce of the Plainfields.

An Ordinance to Regulate Outdoor Advertising

Newport, R. I.—Believing that bill-boards and other forms of outdoor advertising have little use in a beautiful city like Newport, and that they are a liability to the community, the Chamber of Commerce, through a campaign of publicity and with the cooperation of the Newport Garden Club, has recently secured the passage of a very strict ordinance regulating the erection and maintenance of all forms of outdoor advertising. The ordinance covers a broader field than is usual in such ordinances and supplements the zoning ordinance already in effect in this city.

As defined in the ordinance, "outdoor advertising" includes all advertising now or hereafter displayed in the city so as to attract the attention of persons on the highways or on any public carrier, or while in any public building, or park, or other public place, by means of printing, writing, picture or combination thereof, and by any means of display. The only exception is advertising relating to business conducted on private property, to the sale or rental thereof, or advertising in the stations and cars of common carriers.

For every sign or bill-board of greater area than 12 square feet, consent in writing must be obtained from a majority of the owners or agents of the property on both sides of the street in the block where the sign or bill-board is to be erected. With the written consent of the property owners, plans for the structure (which must be fireproof) must be filed with the building inspector, who will determine whether the proposed sign or bill-board is in accordance with the ordinance, and who has the authority to grant or refuse the permit.

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* Six hundred extra copies of this report have been printed, and a copy will gladly be furnished to any reader of The American City interested in the subject, upon request to the author.

Every sign or bill-board to be erected must be at least 4 feet above the natural surface of the ground, must not exceed 14 feet in height overall, must be at least 6 feet from the side of any lot line, must be at least 15 feet back from the street line, and must be limited to 400 square feet in area.

No bill-board will be allowed at any corner of any public way nor within 50 feet of the intersection of any street, nor within 300 feet of any school, public building, church, park, pier, beach, playground, hospital or eleemosynary institution. Any picture of obscene, licentious, or immoral character, on any bill-board or sign-board, in any window or upon any building in any public place or in public view, is prohibited.

There is a fine of $10 per day for each day of violation of the ordinance, and the building inspector is authorized to inspect and remove any and all boards not in conformity with these regulations.

It is estimated that with the enforcement of this ordinance in conjunction with the present state law on bill-boards at least 50 per cent of the bill-boards already erected in this city will have to come down, and there is little likelihood of the erection of any additional boards in the business or industrial zones on account of the severe standard required. In the residential zones no more will be erected, as the City Attorney has already ruled that bill-boards are a business, and also because it will be scarcely possible for any applicant to comply with the requirements of the new ordinance.

W. C. CAMPBELL,
Secretary, Newport Chamber of Commerce.

Chamber Cooperates in Achievement Day Program of Farm Bureau

BOONE, IOWA.—One of the activities of the Boone Chamber of Commerce this year, that we believe has been particularly beneficial to the city, was the cooperation of this organization in the Achievement Day program of the Boone County Farm Bureau. Once each year, shortly before the time of the Iowa State Fair, the farmers of Boone County, with their sons and daughters, bring to this city their live stock—baby beeves, hogs, etc. —that are to be entered at the State Fair. The young people also bring the various articles that they have made during the year in connection with the boys' and girls' clubs in their home towns.

When the officers of the Farm Bureau sought the assistance of the Chamber in planning this year's program, the Board of Directors gladly accepted the opportunity to cooperate, and by so doing to prove the city's interest in the farmers and their work. As one of the principal features of the day's events, we planned a parade of floats, in which the business firms of the city were invited to take part along with their rural neighbors. In the parade, which extended nearly two miles, it was gratifying to find the city well represented. Many of the floats were most elaborately decorated, and prizes in cash were offered for the finest in both the city and rural classes; also for the best floats in each division of the cattle and hog clubs, and for the boys' and girls' demonstration teams. An exhibition was then held at the city armory, with a splendid attendance of both merchants and farmers.

Through the help that the Chamber was able to render on Achievement Day, there has been established a fine spirit of friendship and unity between this organization and the County Farm Bureau. An even bigger and better exhibit next year is planned for, and we have reason to believe it will be a real success.

J. R. BRUNTON,
Secretary, Boone Chamber of Commerce.

PART OF THE ACHIEVEMENT DAY PARADE IN BOONE, IOWA

Hotel Financed by Community Effort Proves Valuable Civic Asset

FREDERICK, MD.—The exceptional hotel facilities that this city has been able to offer since the opening of the Francis Scott Key Hotel have become one of the community's outstanding assets. The construction of this modern hotel, with its 205 rooms and 5 dining-rooms, representing an outlay of approximately $1,275,000, was sponsored by the Frederick Chamber of Commerce and financed by community effort.

For several years it had been realized that the progress of the city was hampered by the lack of adequate hotel accommodations, and the first definite steps toward remedying the situation were taken by the Chamber of Commerce. A hotel committee was appointed, and the possibilities for securing a hotel that would meet the existing needs, and that would at the same time be a credit to the community, were carefully considered. The acquisition of the necessary funds proved to be the outstanding problem, and it was deemed advisable to seek the assistance of some organization specializing in the financing of such projects. The Hockenbury System Inc., of Harrisburg, Pa., was called in to make a survey of the community, and subsequently a campaign was inaugurated for the sale of preferred stock in the hotel. Through the activities of the Chamber and the organization of a large volunteer sales force, a sale of $505,000 of preferred stock was completed within a

THE FRANCIS SCOTT KEY HOTEL, FREDERICK, MD., WITH ITS LOBBY AND DINING-ROOM

week. A 6 per cent first mortgage bond amount-to $400,000 was placed through local banks at par, while a three-year debenture note issue was made for $125,000.

At the end of its first year of operation, the company to which the hotel has been leased on a twenty-year basis was able to take care of all bond interests and sinking fund, and declared a 7 per cent dividend on the full amount of stock issued. Not only is the enterprise proving a financial success, but the hotel is now looked upon as the real civic center of the community, and provides ample accommodations for the meetings of the various local bodies.

W. U. GAVER,
Secretary, Frederick Chamber of Commerce.

Water-Mains Laid by City Forces

HAINES CITY, FLA.—As a result of rejecting all bids for a proposed addition of 22,000 feet to the city water-main system here some time ago, members of the Haines City Council have been presented with a report showing that city employees made the improvement, under city supervision, for $7,623.24 less than the lowest bid from contractors.

According to the report, the lowest construction estimate received from an individual or firm of contractors was $36,500. Added to this was a necessary item of $638.36 for attorney's fees, advertising and printing, making a total estimate of $37,138.36. After several days of discussion as to the best method of procedure, during which Alderman Jess P. Ferrill and City Engineer R. A. Sterzik presented figures to show that the city could lay the main less expensively, the aldermen decided to "do it at home."

The 4½ miles of water-main was laid within the allotted time named in previous advertisements for bids, according to the report, which went on to give an itemized statement of expenses. In addition to the 22,000 feet mentioned in the appropriation, the city employees laid 400 feet of water-main between the high school and the nearest thoroughfare, which was estimated as an asset of $500, and had remaining in stock another asset in the shape of stock valued at approximately $500.

A summary of the itemized statement presented to the Council shows the following expenditures: labor, $1,000; digging ditch and back-fill, $975; material, $27,901.76; and attorney's fees, advertising and printing, $638.36. Credited against the expenditure was $1,000, representing the main laid to the high school, and the stock on hand at the completion of the work.

This made a total of $29,515.12, which gave the city a saving of $7,623.24 over the lowest bid offered by any of the contractors.

REX SAFFER,
Secretary, Haines City Chamber of Commerce.

Stadium Financed by Selling Advertising Space

BESSEMER, ALA.—The acquisition of land for a city athletic park and the erection on that site of a $7,000 stadium, is one of the recent projects launched by the Bessemer Chamber of Commerce and successfully completed with the aid of this organization. The purchase by the city of a 16-acre plot of land adjoining the city limits had often been discussed by some of our progressive citizens, who felt that the site would prove to be a valuable asset to the community, and the directors of the Chamber were fully in accord with the idea. This organization therefore took the initiative in making a proposal that if the city would acquire the land, the citizens themselves would assume the responsibility for its improvement and development for recreational purposes. The suggestion met with the approval of the City Council, the land was bought, and plans for the athletic park went forward.

A Park Commissioner was then appointed and confirmed by the City Council, and a committee of five men, selected from the local Kiwanis Club, Rotary Club, Chamber of Commerce, and City Council, with a fifth man representing the community as a whole, was assigned to work with the Commissioner. These men took it upon themselves to devise a scheme for financing the construction of a stadium, with a grand stand, bleachers, and a surrounding fence. They chose the method of selling advertising space on the inside of the fence, on contracts covering a period of five years, and this met the situation very satisfactorily.

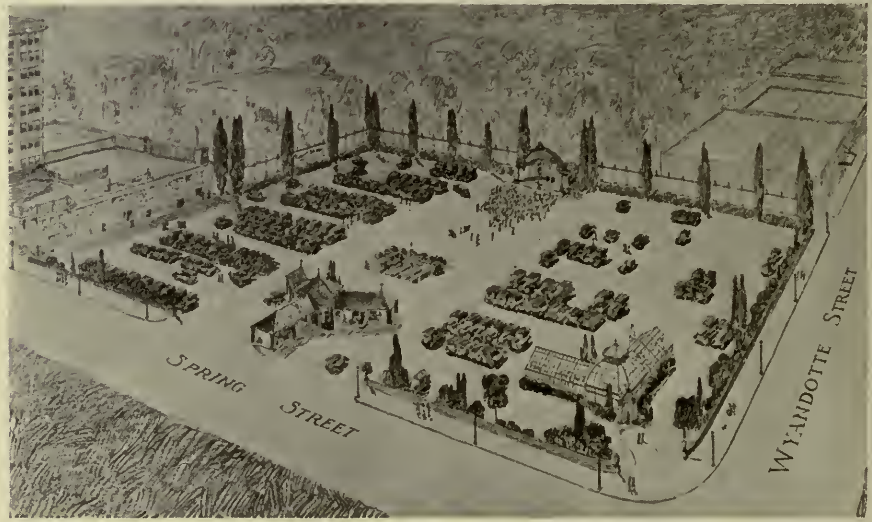
The accredited high schools in this section, as well as our city schools, now hold their football games at the Bessemer stadium, with the result that the park is being maintained at a profit and the school teams are receiving some financial support.

A. F. AUSMAN,
Secretary-Manager, Bessemer Chamber of Commerce.

Free Parking Space for Kansas City

IN the artist's sketch reproduced herewith may be seen an interesting innovation in automobile parking stations, described in a recent issue of *Kansas Citian,* the house organ of the Kansas City, Mo., Chamber of Commerce. This free parking space, covering an area of 472 feet by 288 feet, is being laid out by the Stop and Shop Company in connection with the large retail market now under construction by that company in Kansas City.

In the center of the area will stand a terra cotta gasoline station, with a 150-foot driveway, and at the northwest corner a glass conservatory, to be used strictly for the sale of flowers, will be erected. These two features are being constructed at a cost of about $10,000 each. Leases for both the conservatory and the gasoline station have already been signed. In the center of the south line of the parking space, a large canopy and stage will be built, and it is the intention of the management to make this available for use by the city or any civic organization for evening, Sunday, or holiday band concerts, or other civic entertainments. The parking space will not be used after six o'clock in the evening, except on Saturdays, when it will remain open until a later hour for the convenience of those who wish to patronize the market.



FREE PARKING SPACE WILL BE A FEATURE OF THE STOP AND SHOP MARKET IN ST. LOUIS

EIGHT NOTABLE REPORTS ON STREET AND HIGHWAY SAFETY

Beginning November 23, there are being released by the Department of Commerce, Washington, D. C., a series of pamphlets prepared by the various committees of Secretary Hoover's National Conference on Street and Highway Safety. The subjects of these reports are: I. Statistics; II. Traffic Control; III. Construction and Engineering; IV. City Planning and Zoning; V. Insurance; VI. Education; VII. The Motor Vehicle; VIII. Public Relations. The reports are being made available for consideration in advance of the National Conference on Street and Highway Safety, which is to be held in Washington, December 15-17. Copies of the reports and information regarding the conference can be secured on application to the Department of Commerce

Bringing Business Men Into the Picture

By Richard F. Grant

President, Chamber of Commerce of the United States

WHEN you find a man who has the ability to visualize business opportunities and organize them and make them realities, something always happens. You see great cities and institutions springing up; vast numbers of people coming together; all of the problems that come with community life—crime, disease, unemployment, traffic congestion; rapidly spreading and rapidly growing communities outreaching the bounds and possibilities of the community to keep pace with. Those are the things that follow in the aftermath of the man who sees business opportunity and makes it a reality.

The trouble with the situation, as I see it, is that the man who has the ability to create these things and build up our great urban centers is content to keep his eye on the balance sheet and not go out and straighten up the awful messes he creates of his ability.

How are we going to get him to do it?

Business men are business men primarily because they have the ability to measure facts and reach conclusions; the conclusions must be correct most of the time or they will automatically cease to be business men.

That same ability which makes a man a business man, applied to his community and business problems, is going to see us through. Our principal trouble is with the business man himself. In the past, he has been a tremendous asset to himself, but almost a total loss to the civic life of the country. I am serious about that. To bring the ability and the trained experience of our business men to bear upon our community and our national problems is the first job of the chamber of commerce.

The whole problem, as I see it, is to bring the business man into the picture, making him sense his responsibility and function in the community and national interests. This chambers of commerce all over the country are gradually doing. As a result, such activities as extensions of sewerage and water-works, studies of municipal expenditures, the raising of money for all sorts of civic and philanthropic purposes, perfection of city governments, and on down through the varied list of activities which make for betterment in community life, are becoming the major problems in chambers of commerce to-day.

. . . .

Now, it has been my good fortune to work in chambers of commerce for quite a considerable period of time. Years ago when I first joined the Chamber, I wondered whether I got my money back from the dues, until I got to studying the whole movement and saw the whole significance of the thing—that it was the instrument by which we were going to bring our business men together for the solution of our great community and national problems. Until I saw that picture, I was in the position of a great many other men I know at the present time.

One of the great things that could be done by the secretaries of our chambers of commerce is to go out, and by careful, earnest work, bring that picture and that inspiration into the lives of our business men; get them to see that business does not exist for itself alone, but should be an instrumentality to better the common good and bring the best out of the business men for the public welfare.

From an address delivered at the annual convention of the National Association of Commercial Organization Secretaries, at Washington, D. C., October 21, 1924.

Play the Game!

By John H. Finley, LL.D

Associate Editor, New York Times

MANY years ago, in conversation with that great out-of-doors man and mountain-climber, the author of "The American Commonwealth," Lord Bryce, I was thanking him for an essay which he had written about an English schoolmaster. It was better than any of the essays that he had written of statesmen, prelates or great scholars. His voice choked and the eyes of this rugged man filled with tears as he replied—and then I knew why he had written best of this schoolmaster, Edward Bowen, of Harrow. But what I remember best of this biographical sketch was that he said that Bowen was always saying to his boys, "Take the bitter with the sweet as the sweet and bitter come, and play the game."

Play the game! That is the essence of sportsmanship—playing the game. The value of play is that in most of its expressions, quite apart from the physical value of the exercise, it is teaching honesty, courage, fairness, quickness of decision, self-control, resourcefulness, loyalty. It teaches us to play the game of life honorably, bravely, adventurously and even reverently.

Michael Pupin, the great physicist, whose inventions have helped to make possible long-distance speech, coming to America as an immigrant youth from Serbia, gave this definition of what America meant to him. Perhaps some of you have read it in his memoirs:

"Play the game. What a wonderful phrase! I studied it long, and the more I thought about it, the more I was convinced that one aspect of the history of this country, with all its traditions, is summed up in these words. To 'play the game' according to the best traditions of the land which offered me all of its opportunities, was always my idea of Americanization."

Not only is play the birthright of every child born in this land where freedom to pursue happiness is promised to all, but it is the prerogative of the adult, as well, to keep till death ends both work and play. As some one has said, "People do not stop playing because they grow old; they grow old because they stop playing."

The first great commandment—and I say this reverently—is to play the game with all our heart and soul and strength. That is loving the Divine Creator. And the second great commandment, which relates to our neighbors, is like unto it. It is to play the game according to the Golden Rule. On these two commandments hang all the law of individual happiness and the prophecies of collective welfare.

May you all who are workers be transitive verbs—if you remember what they are—helping individual nouns to reach such objectives as I have defined.

From an address before the Playground and Recreation Association of America, at the Recreation Congress, Atlantic City, October 16, 1924.

Sports Which Are Popular in the Washington Parks

IN an address delivered before the joint annual meeting of the American Institute of Park Executives and the American Park Society with the American Civic Association, at Washington, D. C., October 8, by Colonel C. O. Sherrill, Officer in Charge of Public Buildings and Grounds of the District of Columbia, the following list was given of the principal athletic and recreational activities in the Washington parks, during the last fiscal year:

	Players	Spectators
Athletic field	4,750	19,300
Baseball	56,070	358,530
Croquet	5,928	
Cricket	450	10,500
Basket-ball	72	600
Football	20,376	134,700
Field hockey	4,618	15,100
Lacrosse	312	2,300
Horse hurdles	11,580	
Quoits	3,566	5,620
Polo	1,150	22,600
Soccer	2,172	29,350
Volley-ball	4,596	7,450
Tennis	95,045	
Picnic	34,320	
Archery	100	500
Sylvan Theatre—5 performances		7,500
Band concerts—80 concerts		66,288
Skating—11 days on pool	17,700	
Golf	277,777	
Bathing-beach (4,097 given swimming lessons)	179,130	193,000
Tourist camp—13,821 cars—44,356 persons—Average length of stay, 2 days		
Sand-boxes	6,084	
Boat-house	2,812	
Hurling	1,052	11,900
Speed-ball	1,330	9,050
Riding field	1,900	
Slag-ball	86	
Golf-croquet	86	

Colonel Sherrill said:

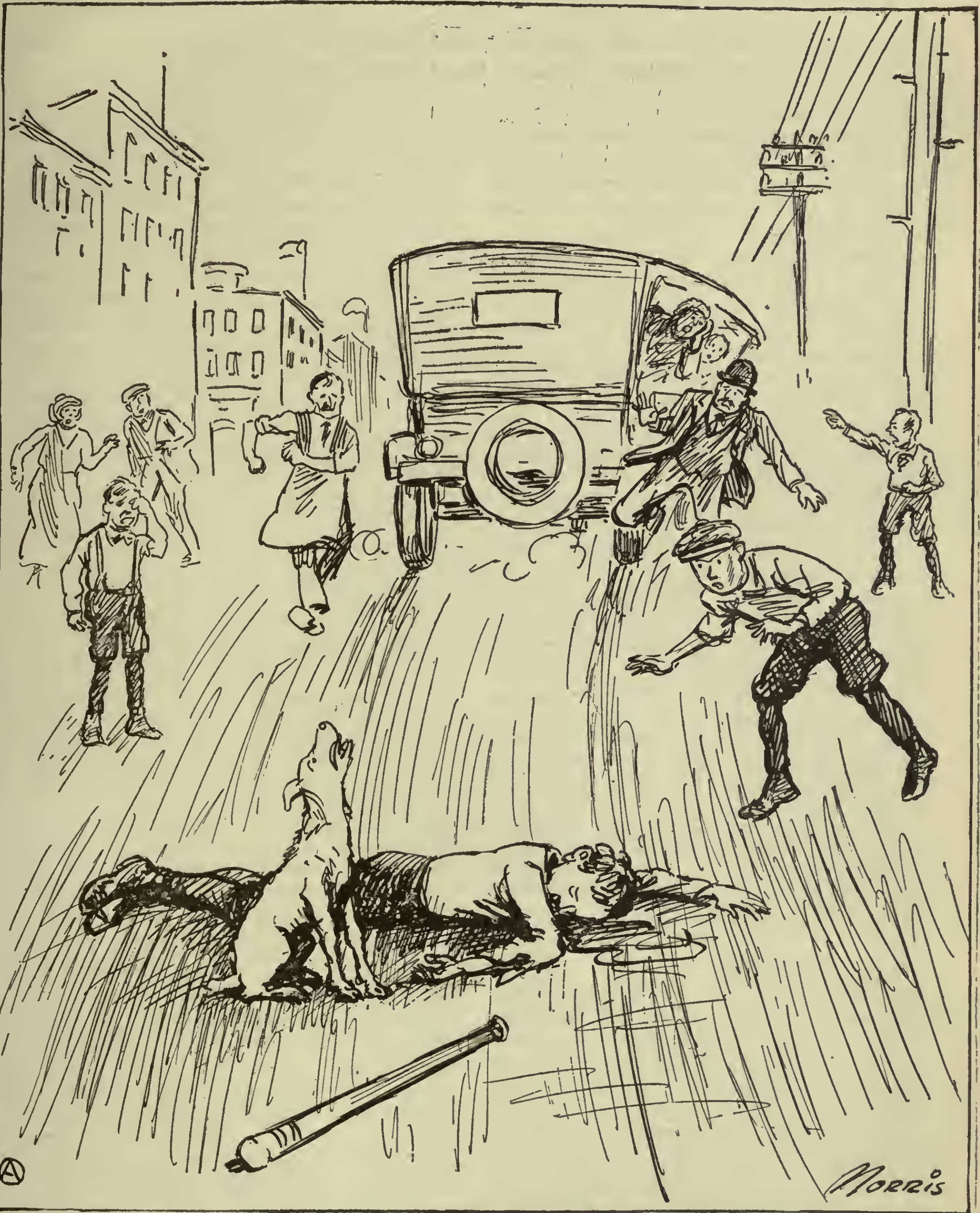
"Under the National Capital Park Commission, which has recently been created and which is authorized to expend $1,000,000 a year for purchases of lands for park and playground areas, I confidently believe that Washington will ultimately have not only adequate park areas, but adequate playground areas properly distributed throughout the entire extent of the city. It is my hope that in the course of the next few years one square will be set aside for park and playground purposes out of every ten or twelve squares of the newer part of the city. In many cases these squares can be ideally adapted to playground purposes and park purposes at the same time by creating playgrounds in the center of the squares, surrounded by an appropriate planting and parking between the playgrounds and the adjoining streets."

14,412 DEATHS FROM MOTOR VEHICLE ACCIDENTS IN 1923

The U. S. Department of Commerce announces that the returns show that during the year 1923, 14,412 deaths resulting from accidents caused by automobiles and other motor vehicles (excluding motor-cycles), occurred within the death registration area of the United States (exclusive of Hawaii), which area contains 87.6 per cent of the total population. This number represents a death-rate of 14.9 per 100,000 population, as against 12.5 in 1922, 11.5 in 1921, 10.4 in 1920, 9.4 in 1919, and 9.3 in 1918. In the 30 states for which data for 1918 are available, the actual number of these deaths increased from 7,255 in that year to 13,043 in 1923, the corresponding rates for these two years being 9.2 and 15.4.

FOR WANT OF A MUNICIPAL PLAYGROUND

By MORRIS



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This is one of a series of civic cartoons which are now being prepared each month at the suggestion of THE AMERICAN CITY Magazine. They are being made available at small cost for use in local newspapers and in the bulletins of Chambers of Commerce and civic organizations. These cartoons will be found useful, also, as publicity aids for the adoption of municipal bond issues and in other campaigns for public improvements.

The Editorial Department of THE AMERICAN CITY will be glad to hear from readers who wish to make use of this service, and to receive suggestions of subjects for future cartoons.

Map-Making for Zoning by Civics Pupils

By Eva Guild Osgood

Chairman, Planning Board, Melrose, Mass.

FOR the first time in the history of city planning, the students of a public school prepared a "present use" map of the city as a part of their study of civics, receiving credits for their work, as a part of their regular study.

Melrose, a residential city of 20,000 inhabitants, was menaced by a development which had been going on for a period of years in nearby-cities. Many citizens from these cities had come to Melrose to escape the intensive two- and three-family housing situation.

Woman Blazes New Trail in Map-Making

The author of this article, who is believed to be the only woman chairman of a city planning board in the United States, has described, for the benefit of small cities, the unique method which she devised for securing, through the public schools, valuable aid and publicity for zoning. Not the least beneficial result of blazing this new trail in map-making was the fact that the whole city was in such a happy frame of mind over the novelty of the idea and so proud of the students' work that there was practically no opposition to the zoning ordinance when adopted.

In her letter transmitting the article, Mrs. Osgood emphasizes the fact that, unless the chairman is willing personally to supervise the work and to meet emergencies as they arise from day to day, the undertaking is not likely to succeed. She also says, "I am convinced that proper publicity is of vital importance in zoning. The proposal to take away century-old individual rights for the benefit of the community must be made with discretion."

The city government asked the Planning Board to prepare a zoning ordinance without delay. The municipal officials were in doubt, however, about the advisability of having one-family districts. A "present use" map was needed to prove that Melrose was essentially a one-family city. The cost of a professional survey was felt to be prohibitive.

In this dilemma the Chairman thought of the potentiality for civic service in the pupils of the civics classes, coming as they did from every part of the city. Believing that real civic work would increase their interest in civics, confident that the average boy or girl would rise to the responsibility and take pride in working for the city, she approached the principal with a plan. He thought the idea feasible, the civics teacher was enthusiastic, and the work began. Five classes, 125 pupils in all, ranging from 14 to 16 years of age, did the work.

Blazing a new trail in map-making taxed the ingenuity of the Chairman, the teacher and the pupils. The official city map was too small and the modern insurance maps too large for the purpose. Finally, the Chairman found some insurance maps over twenty years old of suitable scale.

The pupils traced the pages, 16 x 20 inches, correcting where necessary, matched them together like a patchwork quilt, and retraced them on a large sheet of tracing paper. Economy suggested blueprint paper without thought of the effectiveness of the color.

The elaborate symbol card of the Boston Planning Board, some sheets of gummed paper—red, green, yellow, brown and black—and a book containing a miniature colored copy of a "present use" map, were given to the students with the responsibility of choosing their own symbols, both as to color and shape. They rose to the occasion wonderfully.

Meanwhile, small portions of the official map had been given out, each pupil, if possible, having his own familiar territory. The data of single- and multiple-family houses, business buildings, garages, barns, sheds and hen-houses were compiled, and the actual work of map-making began.

Tiny green rectangles were cut from the gummed paper to represent single-family use, while red served for two-family, with a figure in white ink to indicate multiple use. Segments of small red seals served for garages, the number of points indicating the number of compartments. Stars cut in different shapes indicated sheds and hen-houses, yellow showed business buildings, while black represented public buildings. The old ladies' home had a separate symbol.

For the first time in the history of the school, students had to be driven out of the building at six o'clock by the principal. They realized that the work must be done quickly and worked early and late upon it. All work was done out of school hours.

The result was two amazingly brilliant maps, about 5 by 6 feet, each showing the different uses so plainly that there could be no mistaking them, and proving by the predominance of green that Melrose was a one-family city. The cost to the city was $6.50!

The enthusiasm of the pupils led them to preach zoning to their elders, which gave a publicity of wonderful value. During the progress of the work the local League of Women Voters offered a prize for the civics classes for the best essay on "Why Melrose Should Be Zoned." Over one hundred students competed. Dr. Provandie, the Mayor, who was enthusiastic over the work, offered prizes to the history classes, numbering 400, for essays on "City Planning for Melrose."

The maps were exhibited and prizes awarded by the Mayor at a "Home Beautiful" fair, giving further publicity. The prize-winning essays were printed in the local papers. The newspapers also featured the unique plan in other ways. Pictures were taken of the students, maps, teacher and Chairman, and published in the Sunday newspaper.

The work was begun in November. The maps were ready for the public hearings the first of January. The ordinance was placed in the hands of the Board of Aldermen in February and became a law on March 18, 1924.

One Massachusetts city is working on a similar map at present and others are planning to do so in the near future.

Activities for the Public Safety Division of a Chamber of Commerce

By George C. Lehmann

General Manager, Buffalo Chamber of Commerce

IN the Public Safety Division of a Chamber of Commerce there would be a Traffic Board, a School Committee, and a Citizens' Safe Traffic Committee.

The Traffic Board would act in an advisory capacity to the head of the city's Police Department. Its membership would include representatives of the Chamber of Commerce, the Association of Automobile Dealers, the Automobile Club, the Engineering Society, the Truckmen's Organization, the City Planning Committee, the Terminal Committee of the City, the hotel men, the theaters, the taxicab interests, the Police Department, the Fire Department, the County Engineer, a lawyer and such other representatives of constituted agencies as may suggest themselves, as well as several other prominent business and professional men.

This board would give consideration to all traffic problems, such as one-way streets, fire streets, parking regulations, etc. It would formulate its recommendations and transmit them to the proper authorities for adoption. Of course it would hold stated meetings.

One of the most effective tasks which such a Traffic Board could perform would be the preparation of:

(a) Maps showing traffic movement along main arteries and subsidiary channels in order that traffic distribution and control may be made effective.

(b) Spot-maps of the occurrence of traffic accidents, so that local centers of hazard may be identified. Also,

(c) The making of an intensive study of such local centers, graphically, with proper solutions indicated.

The School Committee would be composed of principals of public schools, as well as parochial schools. Its plan of work would include the issuance of leaflets for the teachers' use in the city schools as a regular part of the educational program. Safety patrols would be formed from the children of the higher grades and properly organized so that each patrol would have a chief, a captain, lieutenants and patrolmen. They would wear some sort of badge and be provided with flags for use at crossings near the schools. The flags would be used under the direction of the police officer regulating traffic at the crossings. The members of the school patrol would keep the children from crossing the streets until signaled by the officer. This committee also would arrange mass meetings of school children in local halls, at which time members of the police and fire departments could deliver safety talks and educational films could be shown.

Inspections for fire hazards and mechanical dangers would be made in public schools generally, but especially in the technical and vocational schools.

In its purely humanitarian appeal, I doubt if there is any other single activity in which a chamber of commerce can engage to which the public gives its approbation more readily than to work carried on to safeguard human life. It is instinctive in humanity to protect oneself. Undoubtedly, the most powerful impulse in primitive man was the protection of himself and his family. That this instinct has not extended so as to include whole communities—the nation itself, if you please—perhaps is due to the too rapid development of civilization. Nevertheless, public attention always can be riveted upon efforts put forth for the saving of life and property.

—From a paper on "Safety—the Chamber of Commerce Opportunity," read at the annual convention of the National Association of Commercial Organization Secretaries, October, 1924. The author covered also the work of an Industrial Safety Division.

The Cost of Public Health

THE feelings of Dr. Fred Converse, County Health Officer, had been ruffled that morning. Bob Cator, the village gossip, had told him that Jackson Holly, a farmer whose place was near-by, had been denouncing him. "He says," went on Bob, "that you and that nurse, Miss Gordon, are nice folks, but that it ain't fair to tax hard-working farmers to let you lie 'round and do nothing."

Dr. Converse had blinked, but had answered laughingly. "Holly's a good man," he agreed. "He speaks right out and gives you a chance to answer him. If you see him before I do, Bob, you ask him to drop into my office some day with his account book, and I'll try to astonish him."

An hour later, when the doctor reached his office, he went over his records to see just what the county health service had done for Mr. Holly; and he was amazed. "Great Scott!" he exclaimed. "I knew our health work came cheap; but I never dreamed that—"

Investment—Not Extravagance

This story, prepared by the U. S. Public Health Service, will be useful, it is believed, for reprinting by local health departments as a means of impressing the voters with the fact that modern public health work is not an extravagant fad, but an investment which pays big dividends.

He broke off as his office door opened, and jumped up to welcome Mr. Holly and half a dozen others who came in, piloted by Bob Cator, who had plainly lost no time in doing as the doctor had asked.

When they were seated, Mr. Holly cleared his throat. "Got your message, Doc," he said, "and came right around. Brought some folks with me as umpires!"

"Great!" Dr. Converse was delighted. His visitors were among the most influential in the county, and he had long hoped to get a chance to talk to them. "I'm mighty glad to see you all. I see you've got your account book, Mr. Holly. Now, if Bob Cator will keep score on the blackboard—Thank you, Bob!"

"Now, Mr. Holly," went on the doctor. "Let's begin by seeing what the county health service really costs you. What health tax do you pay?"

"Pay 22 cents per $1,000 valuation. My valuation's $8,000; makes my health tax $1.76 a year. Don't seem much to city folks, maybe; but it's only one thing out of a lot; and it all counts up when a man's got to earn his living in the blazing sun."

"Quite true. And whether it's much or little, you're entitled to know what it's spent for" . . . "Bob! Put down Cost on the board and below it write, Health Tax . . . $1.76. Any other costs, Mr. Holly?"

"Lots of them." Mr. Holly opened his account book. "Here's the cost of those danged window screens you fellows persuaded the county to make us buy to keep out mosquitoes and that weren't a darned bit of use to us. That's an expense, all right! Course, you fellows didn't get the money yourselves, but—"

"All right. What did your screens cost?"

"$14.25. That's for the house and for the annex where the farm help lived."

"All right! Put it down, Bob! To health investment, $14.25. Of course, Mr. Holly, you know the county spent as much more in oiling and draining the ponds where the mosquitoes breed. That's something you got for your health tax. But never mind! Tell me: How much did you spend for malaria sickness—medicines and doctor's bills—for the 12 months before you put in the screens?"

Mr. Holly thumbed his book. "Bout $20 for doctoring and $2 for quinine," he decided.

"All right. Now, how much have you paid for the same things during each of the two years since you put the screens in. It's been just about two years, hasn't it?"

"Ye-es. I reckon so. But—" Mr. Holly frowned and searched his book. "Paid mighty little," he admitted. "We ain't had any malaria worth speaking about these two years. The mosquitoes just didn't come 'round. And so, of course, the screens didn't do us a bit of good."

"Didn't they? The mosquitoes came around all right in Atla County, right next door; didn't they?"

"Well—maybe they did, the first year, anyhow! Last year they didn't come anything to speak of."

"Wasn't that because Atla County screened and oiled and drained a year later than this county did? Isn't it fair to estimate that you would have had to pay at least another $22 each year if you hadn't put in those screens. Atla County people paid at least that much.

Seems to me that your health investment of $14.25 has saved you two times $22—$44 or $29.75 net. And you've got your screens still. Shall we ask Bob to write down: Profit, $29.75?"

Holly hesitated. But the umpires chuckled and he agreed hastily. "Yes! Put her down, Doc," he said. "Guess that's all about those screens, ain't it?"

"Not quite. How many days' work did you and your men lose from malaria in the year before you put in the screens?"

Mr. Holly frowned. "Oh! Five or six days, maybe," he said. "But what's that got to do with it?"

"Everything. You paid the men, didn't you?—and lost five or six days, because they were too sick to work; so you lost the money. And you were down with malaria yourself that summer, weren't you? Lost some time, didn't you? And even when you and the men were better, you weren't up to par so you could do a real full day's work, were you? And in the next two years you didn't lose anything like so much—from malaria? The screens, etc., saved you the difference between what you lost the first year and what you lost in each of the last two years."

Holly scratched his head. "Well, if you want to count that, I s'pose you've got a right to do it," he said. "Say, Bob! I reckon you'd better chalk down about $25 dollars profit from saved wages due to those blamed screens. Now, what's next, Doctor?"

"Smallpox!"

"Smallpox? There ain't been any smallpox here since I came, except, of course, what that Stone family brought when they refugeed here from the west end of the state and sent their two children to school, till they broke out with it two days later. But it didn't spread."

"Why didn't it spread?"

"Well, I don't know. I don't hold much with vaccination; but I reckon it was because most everybody here, especially the school children, got vaccinated right away. But what—"

"Who vaccinated your family?"

Holly hesitated. "Well," he said, finally, "Mandy—Mandy's my wife, you know—Mandy went wild when she heard about the Stone children and she grabbed two of our children, all she could get her hands on right then, and rushed them to Dr. Morford's and had him vaccinate them. If she'd waited half an hour, we could have brought them to you and got the six of us fixed up for nothing." Holly turned resignedly to the blackboard. "Bob," he said, "enter up $4 to saving on vaccinations."

The umpires applauded freely, and Mr. Holly joined in, though somewhat ruefully.

Then Dr. Converse resumed. "Now about the public health nurse," he remarked. "Being a mere man, Mr. Holly, you probably don't remember how many visits Miss Gordon made to your place the first year you were here. But I see Mrs. Cator at the back of the room; and I'll ask her to tell us all about Miss Gordon's visits to her when her baby was born last spring and when her other girl was ill the fall before that. How much were those visits worth, Mrs. Cator?"

Mrs. Cator stood up. Twice she tried to speak before the words came. Then—

"I don't know," she burst out. "You ask Bob Cator how much his wife and children are worth to him. That'll be just what those visits were worth. I ain't saying anything against Dr. Morford; he's a mighty good doctor, I reckon. But he's just a man, and I lived a long way from everywhere and—and—My God! When I remember that time—It was Miss Gordon's coming that pulled us through. It was having another woman around—a woman that knew what to do and that did it without making any fuss about it. And—and—" Mrs. Cator swung around to her husband. "Bob Cator, if you been saying anything against Miss Gordon, or against Dr. Converse either, I'll—I'll—." Helplessly, she dropped into her chair.

When the umpires had gotten over their somewhat hysterical laughter, Dr. Converse resumed:

"I'll come back to health nursing after a little," he promised. "But just now I want to take up another subject." He turned to Holly. "Mr. Holly," he said, "I hope I won't offend you by what I'm going to ask. You'll understand why I do it after a little while. Won't you tell us how your children stood at school the first year after you came here?"

Mr. Holly flushed hotly. "Get offended?" he exclaimed. "No! I won't get offended. But I'm hurt a lot. It wasn't the fault of those little tykes that they didn't stand high. All four of them was sick when we come down here; and it wasn't to be expected that they'd do much—"

"Exactly. Where you came from you didn't have any malaria problem. And unless you wished you didn't have to put in any screens to keep out the flies that carried filth on their feet. Two of your children had typhoid fever in Tunlaw County, didn't they?

Got it from flies or from an infected well, probably. None of them had it down here, did they? Do you know why? It was because I, as health officer, made Jones, who sold you the farm, fill in his well because it was a cesspool of pollution and dysentery and typhoid that had cost him the lives of his wife and his only child. I made him dig another in a better place by threatening to prevent his selling his farm to anybody until he did. That's why you haven't had any bills to pay for typhoid or dysentery or maybe for funerals. Those mosquito screens that keep out flies and the sanitary privy that kept the flies from getting pollution on their feet to be carried to your food saved your family. Can you calculate how much all this service was worth to you?"

Mr. Holly shook his head. "No, I can't," he admitted. "But I know it's worth a lot."

"Then try to calculate this: When you came here your two eldest boys had hookworm disease; they probably got it when they visited their uncle down in the hookworm belt. One of them and your girl had adenoids that were deforming their faces and interfering with their breathing and thinking. Your girl also had a catarrh that made her so deaf that she couldn't hear half the teacher said; and so she got the credit for being dull and stupid—"

"Dang you!" Holly was on his feet. "Maybe that's true, but I ain't going to listen to any more of it, I just—"

"Then listen to this, Mr. Holly. Why is it that your children are now among the brightest and healthiest and finest children in the school? I'll tell you why. It's because the county health service cured the two that had hookworm and gave them a chance to get well and strong. And it's because Miss Gordon nearly wore herself out going to your house the first winter you were here and urging Mrs. Holly to persuade you to have the adenoids that were ruining two of your children taken out at our nose and throat clinic; and persuading you direct to take little May to town to a surgeon to have her hearing attended to. She isn't considered stupid now, is she? I'll tell the world she isn't. Consider what those children are now and what they were then; and tell me what the county health service has done for you that's worth while."

"Done for me?" Holly was on his feet once more. "It's done everything for me. It's made me attend to things that I was too big a fool to attend to of my own accord. It's sent you here to give me advice for—for—Good Lord!—for $1.76 a year. Think of it: $1.76 a year! It's given my boys health and strength and a chance to be something. And it's given me back my little May, as bright and rosy as she was when she was a baby. Doctor, you needn't calculate any more. Just charge me up with a million dollars' worth of health—price $1.76."

Abandonment of Plain-Clothes Traffic Officers Predicted

COMPLETE abandonment of the use of plain-clothes officers in the work of bringing automobile speeders to justice within the next year is predicted by the American Automobile Association in a special dispatch sent to all affiliated motor clubs throughout the country from its national headquarters in Washington, D. C.

This prediction is based upon an exhaustive investigation of the police methods of the principal cities in this country with regard to the arrest of speeders and motor law violators. Of the 61 police chiefs consulted, the dispatch shows, only 3 reported the use of ununiformed officers in the work of catching speeders, and 5 reported a dual system whereby traffic officers were both in uniforms and in plain clothes. Of the 53 cities now using uniformed police exclusively for traffic law enforcement, 23 had at one time tried plain-clothes men and abandoned the system.

Commenting upon the facts, Thomas P. Henry, President of the A. A. A., says that, the trend of enforcement being toward uniformity, as with all automotive legislation, the secret method of arrest cannot expect to gain favor and must be discarded.

The A. A. A. has summarized the reasons for abandonment of the espionage system, as advanced by the leading police chiefs, as follows:

It has never been necessary to put out plain-clothes men to catch speeders. Detective methods are necessary only for violations which are not done in public.

Uniforms are a protection to the motoring public as well as to the police force.

The uniform has a very deterrent effect upon would-be violators.

It is more important to discourage a motor violation than to make an arrest after something has happened.

Good policing consists in maintaining order without arrests.

Espionage presupposes the motorist a criminal.

It also encourages fatalities through obvious confusing of police with highwaymen and grafting constables.

"The A. A. A.," says Mr. Henry in conclusion, "believes that the few cities now using the spy system will have to abandon it presently, not merely because it has been found to be inadequate and illogical by the many other cities that have tried it, but mainly because the time is not far distant when no city will be able to enforce any plan that is out of key with the motor regulations of the country in general."

The New Sewage Treatment Works at Worcester, Mass.

By Ralph G. Lingley

Superintendent, Sewer Department, Worcester, Mass.

WORCESTER, a city of 200,000 inhabitants, is located at the head of the Blackstone River, the most highly developed river as to water-power in the United States. The second chemical precipitation sewage treatment plant in this country was constructed in Worcester in 1890, by C. A. Allen, then City Engineer. Copperas was present in the sewage as a trade waste, and lime has been the only chemical used. This plant is in use to-day and takes care of about 86 per cent of the sewage. In 1904, the first detritus chamber constructed in this country was placed in operation by Harrison P. Eddy, then Superintendent of Sewers.

From 1899 to 1910, sand filters to the extent of 74 acres were constructed, and they are now used to treat about 14 per cent of the sewage flow, after it has passed through two settling-basins where the detention period is about 30 minutes. From 1904 to 1918 much experimental work along sewage treatment lines was carried on.

In 1919, the State Legislature enacted a law compelling the city of Worcester to construct a new sewage treatment plant to be ready for operation April 1, 1924. The time was subsequently extended to July 1, 1925. The City Government at once ordered an Imhoff tank trickling filter sewage treatment plant to be built, and it is now nearing completion.

The new plant has detritus chambers, a Venturi meter, Imhoff tanks, dosing tanks, trickling filters, secondary tanks, sludge drying beds, and a modern laboratory building. The design is based on an average daily sewage flow of 28 million gallons from a population of 275,000 in 1940. The plant is located 3.5 miles south from the center of the city and adjacent to the sand filters of the present chemical precipitation plant.

The detritus or grit chamber consists of two channels, 85 feet long and 6 feet wide, the pit depth at the inlet end being 2.5 feet and at the outlet end 4.0 feet, furnishing grit capacity of about 100 cubic yards. The design is planned for sewage flows up to 67 million gallons daily with an average velocity of flow of about 1 foot per second.

Gates are provided for draining off the top water when a chamber is to be cleaned. The inlet gate is then to be opened and sewage used to scour out the grit through a 30-inch gate onto one of the present sand filters close by. After drying out, the material can be scraped or carted to near-by spoil areas. It is expected that frequent cleaning will minimize any offensive odors. The design is such that cleaning may be done by a crane with a

AN AERIAL VIEW OF THE WORCESTER SEWAGE WORKS

This picture shows the small space occupied by the new plant shown in the lower left-hand corner as compared with the old plant clam-shell bucket attached to it.

From the detritus chambers, the sewage will flow through 1,100 feet of inverted siphon, thence through the Venturi meter to the Imhoff tanks.

There are twelve Imhoff tanks, each 60 by 90 feet in plan, with a water depth of 31 feet; each tank has four sedimentation compartments, the slope of the bottom being 1.5 on 1.0, and all together give a 2.5 hours' detention period based on 28 million gallons daily. Open channels are used throughout, and provision is made for distributing and reversing the flow of sewage. Scum boards are also provided.

Each tank has five gas vents extending the length of the tank, the middle three being 36 inches wide, and the outside two each 18 inches wide. The gas vent area is about 21 per cent of the tank area.

There are six sludge hoppers in each tank, 30 feet square with a bottom slope of 1 on 2. The depth of sludge storage below a point 24 inches from the 8-inch slot is about 17.5 feet, sufficient for a period of about five months. The sludge storage capacity is approximately 5.9 million gallons, representing about 3 cubic feet per capita. Drains are provided for drawing the tanks down to the top of the sludge hoppers. Sludge pipes, 8 inches in diameter, will remove the sludge under head to adjacent sludge beds which will be constructed in the present sand filter area. Perforated water pipes will be placed on each slope for agitation of the sludge.

The dosing tanks are in four units, each having two compartments, 30 feet square, with twin alternating 36-inch siphons. Each unit doses one-fourth of the filter area, or 3.5 acres, under variable effective head of 7 feet to 1 foot. One side of each compartment is so constructed as to assist in giving uniform distribution of sewage upon the filter. Each compartment has an approximate capacity of 36,500 gallons and, at the 28 million gallons rate of sewage flow, provides filter dosing and resting periods of three minutes each. At the maximum rate of sewage flow the dosing tanks will function, but there will be practically no rest period of the filter. The channels to the dosing tanks have overflow weirs and are so arranged that the Imhoff tank effluent can be discharged directly into the river.

The trickling filter, 752.5 feet by 792.0 feet in area, or 14 acres, is divided into two units and has 10 feet depth of crushed granite and trap rock, screened through a 3-inch ring and held on a 1¼-inch ring. Each quarter-section of the filter has a concrete main distributor decreasing from 54 to 24 inches in diameter followed by a cast iron section decreasing from 20 to 12 inches in diameter. From this main distributor are 8-inch cast iron laterals reducing in size to 6 inches. These distribution pipes are to be laid in the top stone, spaced so that the nozzles are staggered and 15 feet apart.

The concrete floor, sloping to the main drains, has concrete ridges, 15 inches on centers, upon which are set precast cement mortar beams on edge, the beams being 16 x 4 x 1½ inches. These beams form a grid floor above the bottom and have open or air space of 43 per cent. Each half of the filter has two main drains which collect from 100 feet of floor on either side and carry the effluent to the secondary sedimentation tanks. Inspection galleries are provided over each drain and at the ridges halfway between the drains. The filter is enclosed by a concrete wall and either half can be flooded if desired. Treating an average daily sewage flow of 28 million gallons, the rate of operation will be two million gallons per acre per day.

There are four secondary sedimentation tanks, one for each quarter of the filter. Each tank is 60 feet by 120 feet, and 15 feet water depth, the direction of flow being across the short dimension. Each tank bottom has eight hoppers, 30 feet square and 7 feet deep. Sludge pipes, 8 inches in diameter, are provided, and the sludge will be pumped to the Imhoff tanks or directly to the sludge drying beds. Based on the 28 million gallons daily rate of sewage flow, the de-

CONSTRUCTION VIEW OF FLOOR OF TRICKLING FILTER AND INSPECTION GALLERY

CONSTRUCTION VIEW OF SECONDARY SETTLING TANKS FOR NEW WORCESTER, MASS., PLANT

tention period is 1.5 hours.

The elevations of the sludge discharge pipe from the Imhoff tanks and the sand filters of the present plant are such that about 18 acres of the filters are available for sludge drying beds by piping to them and dividing into smaller units.

All buildings will be constructed of similar materials; shrubbery and drives will be provided and the grounds kept in as attractive condition as possible.

Acknowledgment.—From a paper read before the American Society for Municipal Improvements, at Boston, Mass.

National Association of State Chambers of Commerce Organized

AT a meeting of Presidents and Secretaries of State Chambers of Commerce, held at Pittsburgh on October 9, it was decided to effect a permanent organization, and Stanley H. Bullard, President of the Connecticut Chamber of Commerce, was chosen as its President, and George B. Chandler of Hartford, Secretary of the Connecticut Chamber, as its Secretary.

The purposes of the new organization are, first, to cause to be prepared and assembled a fund of literature on the best state chamber of commerce practice, comparable with the matter of a similar nature bearing on local chambers. In some states where an attempt has been made to organize a state chamber, the promoters have floundered and failed because of the absence of any text-book or guiding principles. A second purpose of the organization is to carry on a campaign of education in those states where there are no state chambers, or in which the organizations have been wrongly started and are struggling for existence.

There never has been a time when there was a greater call for state-wide organization combining all business groups than now. Many wise students of American affairs are apprehensive of the trend toward centralization in the hands of the Federal Government, and a resulting loss of the historic balance between nation, state and municipality. Moreover, as has been repeatedly pointed out, an overwhelming majority of the laws affecting personal and business relations are a state enactment or state execution. The state is still the most vital unit in our American system of government, and the Federal and local governments possess only such powers as have been delegated to them. All undelegated powers reside in the states.

To combat the short-sighted selfishness of certain organizations which fear the encroachment of state chambers of commerce, to dispel misunderstanding, and ultimately to extend the state chamber of commerce movement throughout the country, is the ambition of the founders of this new organization.

Now in Preparation—The 1925 Edition of The American Municipal Yearbook,

THE MUNICIPAL INDEX

A reference work of great practical value to municipal officials, civic organizations, educators, public libraries, and others having to do with municipal and county improvements.

The seventeen sections of the 1924 edition contain more than 148,000 words of text matter, exclusive of 261 pages of abridged catalogs. There are also more than 9,500 words descriptive of the activities and services of 114 national organizations and 25 Government bureaus serving municipalities. The bibliographies contain more than 1,100 entries; the alphabetical list of subjects, 675 entries; and the classified list of products and services, 943 entries under 375 headings.

The American City Magazine, 443 Fourth Avenue, New York

Ideas for Christmas Observances by Municipalities

WITH the celebration of another Christmas season now but a few weeks distant, no doubt a greater number of cities than ever before are planning to bring together all their citizens for a truly community-wide festival. For those who are planning the programs, perhaps the following brief suggestions, which have come to THE AMERICAN CITY from various sources, may be of some help.

While the tree, hung with lights and tipped with the symbolic star, has become the center of most celebrations, its effect will be enhanced if there can be some subsidiary decorations in the surrounding neighborhood, carried out in the season's colors of green, red, and white. The local merchants might combine their resources for some general scheme of decoration for the business district. Cities with foreign populations might adopt the plan of spreading banners, bearing the words "Merry Christmas," or "Welcome," written in various languages, across the streets leading to the tree. Several cities have planted permanent community Christmas trees. Atlanta plants a tree each year in one of its parks, forming a group of trees as a permanent setting for its Christmas festivals. Milwaukee builds a giant tree out of about 400 average-sized trees, placed in sockets on a 75-foot telephone pole.

Hand in hand with the community Christmas tree has of course come the revival of the old custom of caroling. In addition to the singing of carols by the assembled crowds around the tree, many cities have organized groups of "waits" who sing along specified routes through the city streets. A widely adopted custom is that of announcing that the carolers will sing only where candles or other lights are displayed in the windows as a sign of welcome. On Christmas Eve in one city a band of carolers sang while trains were

A CHRISTMAS WINDOW EXHIBIT OF THE CIVIC CLUB OF ALLEGHENY COUNTY, PITTSBURGH, PA.
The "Hope Chest" contained more than a hundred boxes, presented by a leading department store, wrapped ready for use. Two of the boys from the Junior Civic Club marked them

IF IT'S AN "OLD-FASHIONED" WINTER, AN ICE CARNIVAL, SUCH AS THIS ONE IN NEWBURYPORT, MASS., WOULD MAKE AN EXCELLENT FEATURE FOR THE CHRISTMAS HOLIDAY SEASON

stopped at the railroad station, and a delegation boarded the trains and presented each passenger with a greeting card from the community. The number of American cities that have adopted the custom of outdoor caroling increased from 30 in 1918 to 1,285 in 1923.*

For the program of entertainment at the tree, material for many appropriate plays, pageants, tableaux, etc., can easily be obtained. But as outdoor features are often spoiled by inclement weather, it is well not to overlook the possibilities of indoor celebrations, also. In large cities, Christmas joy might be spread by holding several celebrations instead of one. In cities with poor districts, the saving in car-fare to parents with large families is a consideration.

In addition to the tree and its accompanying entertainment program, there are many ways in which the Christmas spirit may be shown. For instance, some cities make it easier for mothers to do their shopping at this time by arranging for the care of babies and small children at a temporary nursery. Last year the Flint Chamber of Commerce maintained a wrapping and mailing station for packages, and provided the paper, pen and ink, and small cards for enclosure. The Postmaster gladly furnished men to handle the weighing, selling of stamps, etc. Huge greeting cards, such as the one used in Boston last year, may be erected at railroad stations to welcome the stranger within the gates. In one community, a great municipal stocking filled with gifts brought joy to many needy children. In another community the warmth of the Christmas spirit was spread by a fire burning for a week before Christmas in a large community fireplace built out-of-doors by the Board of Trade.

Whatever form the celebrations may take, there should be no one in the community who does not know that it is Christmas and that his townsmen want him to share in the Yuletide spirit of cheer and good-will.

The Semi-Annual Index to The American City, July-December, 1924, will be found immediately preceding the back cover of this issue.

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* These statistics are embodied in "Christmas Caroling in 1923," a survey issued by the National Bureau for the Advancement of Music, 45 West 45th Street, New York City.

The Playground and Recreation Association of America, 315 Fourth Avenue, New York City, has prepared, in mimeographed form, the following material: A set of four Christmas programs, 50 cents; "The Perfect Gift," by Elizabeth H. Hanley, a community Christmas pageant, 25 cents; "A Miracle of Christmas," by Faith Van Valkenburg Vilas, a one-act play, 25 cents; "Seven Gifts," by Stuart Walker, a Christmas pantomime, 15 cents; "The Community Christmas Tree," by Grace Humphrey, a description with illustrations of the first Community Christmas Tree celebration held in New York, 10 cents; "Christmas Carols," the words of ten favorite carols, 70 cents per hundred, $7 per thousand, plus postage.

Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway), and from other sources

For further information, Mr. Williams may be addressed in care of
The American City Magazine, 443 Fourth Avenue, New York

Recent Zoning Decisions

Maryland.—*Green and Cordell v. Mayor, City Council and Board of Zoning Appeals of Baltimore City and Benjamin Love; City Court of Baltimore.*—The Board of Zoning Appeals, in variation of the strict letter of the ordinance, ordered the issuance of a permit for a tailoring shop in a residential use district. The proposed shop will be next door to an existing non-conforming grocery and directly across the street from an open railroad cut. The applicant carries on business in a building to be torn down. The Board was of opinion that it would be a hardship for the applicant to be driven from the neighborhood; that the conditions in the neighborhood justified the variance; that the value of property in the neighborhood would not be depreciated; nor the fire hazard increased. The City Court, with a jury, affirmed the decision of the Board of Zoning Appeals.

A Notable Zoning Event

The recent decision by the highest court in Massachusetts sustaining the constitutionality of zoning in the four cases mentioned on this page, is a notable zoning event. It will be remembered that Massachusetts has passed a constitutional amendment authorizing zoning. These decisions are precedents, however, in the other states of this country; for the provisions under which the validity of zoning statutes can be challenged are, substantially, the same in the various state constitutions and the Constitution of the United States; and the Massachusetts Court sustained the law and the Massachusetts amendment, under the United States Constitution. The Court (in Inspector of Buildings of Lowell v. Stoklosa), reviews the cases on the subject, saying of some of them which are not in favor of zoning, "Other decisions having a contrary appearance may rest upon other grounds," and of those clearly contra, "we are not inclined to follow them."

Massachusetts.—*Inspector of Buildings of Lowell v. Stoklosa, Supreme Court, October* 18, 1924.—Suit in equity to restrain the defendant from erecting a store in violation of an ordinance dividing the city into residential and business zones. The ordinance was passed under a statute enacted by virtue of an amendment of the constitution of the state. *Held,* adopting the opinion in *Opinion of Justices,* 234 Mass. 597, that the act does not violate either the constitution of Massachusetts or that of the United States; and that the constiutional amendment authorizing the statute was in no respect in contravention of the Constitution of the United States. The ordinance defined as a building district lands fronting upon each section of a street between the boundary lines of each two adjacent intercepting streets, etc. Any such district in which "not less than one-half the ground floor frontage of both the district and the frontage on the other side of the street immediately opposite said district are . . . . devoted to business or industry," etc., shall be a business district; other districts shall be residence districts. Existing uses may continue. Buildings in a residence district may be erected or altered for business or industry only on application accompanied by the consents of owners of three-fourths of the frontage used for other than business purposes of the district, opposite it, back of it, or within a certain distance on each side of it; provided that the City Council after public hearing shall so order. *Held,* that the ordinance did not transcend the statute. Every intendment is to be made in favor of the lawfulness of the exercise of municipal power under the police power; and it is not in the province of the courts to interfere except in clear cases. The provision making local consents a prerequisite to action by the city authorities is lawful.

Brett v. Lyon, Building Commissioner of Brookline, Supreme Court, October 18, 1924.—Brookline, by amendment of its zoning ordinance, made after some work had been done on two-family houses in a certain area, made that area a one-family house district. *Held,* that such districts may lawfully be created under the police power. Such regulations may be regarded as preventive of fire, or promoting the public health and morality. "The question to be decided is not whether we approve such a by-law. It is whether we can pronounce it an unreasonable exercise of power having no rational relation to the public safety, public health or public morals. We do not see our way clear to do that."

The petitioners have no special immunity because permits were issued to them. They had begun work under the permits but it had not gone far enough to give them a vested right against a change in the by-law by the law-making power. When acted on, such permits cannot be revoked by a licensing board except by special power to that end or a change in legislation, like the change in by-laws in this case.

In accord on the second point: *Bamel v. Building Commissioner of Brookline, Supreme Court, October* 18, 1924.

Spector v. Building Inspector of Milton, Supreme Court, October 18, 1924.—Mandamus to compel the issuance of a permit for the erection of stores. Before a zoning ordinance was adopted, the petitioner bought the land in question to erect the stores thereon. He filed plans for twelve stories, and later filed plans changing them to eleven-story buildings.

In order to prevent the erection of these stores, the Selectmen directed the Inspector to delay the issuance and delivery of the permit, meanwhile preparing a zoning by-law and presenting it to a town meeting, which passed it. The by-law forbids stores in the district in which petitioner's land was situated.

Held, that the zoning ordinance was suited to a town of the character of Milton, the district in question was residential in character, and the fact that the petitioner's land would be worth more for stores did not invalidate the provision. "Every exercise of the police power in respect to the use of land is likely to affect adversely the property interests of somebody. That caused to the petitioner by the zoning by-law is far less in degree than in Fisher v. St. Louis, 194 U. S. 361" (citing other cases also).

The fact that the application for a permit was filed before the by-law was enacted, did not make it inoperative as to the applicant. The filing of the application gave him no vested rights.

The disingenuous conduct of the respondent and the other officials cannot stand in the way of the common good of the people, as manifested by their vote.

NEW YORK.—*Bartsch v. Rahonetti, before Benedict, J., Supreme Court, Kings County, October* 23, 1924.—The excavation and carting away of sand, and the erection of temporary structures in pursuance of the work, in a residential district, is not violative of the New York City zoning resolution.

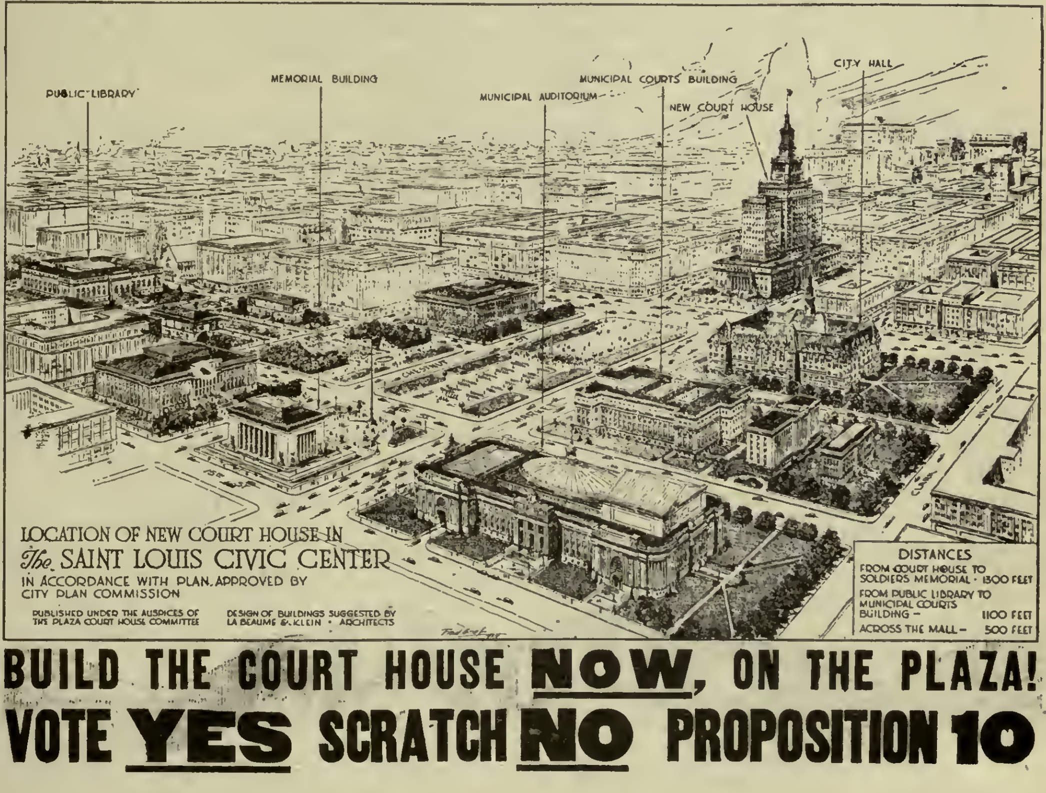
..*Headley v. Fennell, Superintendent of Buildings of City of Rochester, Supreme Court, Monroe County, October* 10, 1924.—The provision of the Rochester zoning ordinance, creating one-family residential districts from which apartment houses are excluded, is valid.

State ex rel. Barker v. Boellger, Chairman, Supreme Court, Westchester County, July 25, 1924.—The Board of Appeals had power to allow the erection of a public garage on a lot in a business district, extending twenty-five feet into a residential district, with an entrance from the courtyard of an apartment house. The use of such a door saves the necessity of the automobile's passing both in and out every time a passenger goes to or leaves the building. The permit, however, should be on condition that no person except an occupant of the apartment house use the door for ingress or egress with an automobile.

St. Louis Backs Up Its City Plan Commission

BY a decisive majority of over 35,000, the citizens of St. Louis at the recent election upheld the ordinance previously passed by the Board of Aldermen for the building of a new court-house on Twelfth Street, as included in the plans for a municipal plaza and public building group set forth by the City Plan Commission.

Since the passage of the bond issue for this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VOTE YES SCRATCH NO PROPOSITION 10

Texas buys a train load

Full Force Feed Oiling System

In "Caterpillar" motors full force feed lubricating system is used. Oil is delivered under pressure to the main bearings, thence through drilled passages in the crankshaft to the connecting rod bearings. The grooves in the connecting rod bearings are tapped by a tube running up to the piston pin bearing, thus delivering oil under pressure to all working parts. The "Caterpillar" can run continuously in extreme position, forward, backward or sideways with lubrication absolutely dependable at all times.

Inaugurating its program for maintaining some 18,000 miles of roads, the State Highway Department of Texas selected "Caterpillar" Tractors for the heaviest grading, maintenance and hauling work. Twenty-three 10-ton "Caterpillars"—a complete train load—were recently purchased; one of the largest and certainly the most important order for tractors ever placed in Texas.

The "Caterpillar" has had a mighty part in the development of this great state; it was the logical choice for such public responsibilities. Throughout Texas, county after county, city after city has found "The Nation's Roadmaker" the most efficient power for road making and other public works. On numerous industrial and agricultural operations, "Caterpillars" have been called upon to perform tasks too important or too difficult to entrust to any other machine or method.

The State officials and engineers in charge of this department have been highly commended by the taxpayers and citizens of every class, for their foresight in assigning "Caterpillars" to the task of getting the most work done with the greatest economy of road funds.

For snow removal, earth moving contracts, engineering projects and other public works—wherever there is need for the utmost in tractive power and endurance—the "Caterpillar" has no real competitor. The 2-ton is ideal for all lighter hauling. The 5-ton is an undisputed leader in the medium power class. The 10-ton is in a class by itself in the heavy-duty field.

See our exhibit at the Good Roads Show, Chicago, Jan. 5 to 10.

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project in February, 1923, and the approval of the plans by the citizens, an organized effort has been made by a powerful group of down-town interests to have the new court-house erected in the vicinity of the old building now standing on Fourth Street, rather than on Twelfth Street, as provided for by the City Plan Commission. When an ordinance was passed by the Board of Aldermen designating Twelfth Street as the location of the new building, the down-town group decided to bring the matter to an issue at the November election by submitting a referendum petition.

The election was preceded by a vigorous campaign, in which the down-town group expended a large fund for newspaper and street-car advertising, the distribution of circulars with packages delivered by department stores, etc. Against such strongly organized banking and commercial interests, and with only a small fund of about $3,000 available, it was difficult to present the city planning point of view, but this was done most effectively through a committee, representing chiefly the local women's organizations, the American Legion, and the labor organizations, cooperating with the City Plan Commission, of which Harland Bartholomew is Engineer.

Following the approval of the ordinance by the voters, the referendum committee publicly announced their acceptance of the people's decision. The complete execution of the plaza and group plan as prepared by the City Plan Commission is now assured, and a commission of architects to supervise the plans for the buildings and improvements will shortly be appointed.

The Municipal Bond Market

By Sanders Shanks, Jr.

Editor, *The Bond Buyer*

AT the November elections, in addition to voting for a President and a Vice-President of the United States and other Federal and local officials of importance, the voters of many communities were asked to decide whether or not bonds should be issued to defray the cost of certain public improvements. Reports are now available showing the results of about two-thirds of these bond referendums, including virtually all those where large bond issues were proposed.

As of November 14, it appears that seventy-two communities (by community is meant an entire state, a county, a city, a village or a district) approved issues aggregating $258,230,000, while twenty-eight communities defeated issues amounting to $114,412,700.

Among these defeated propositions, Kentucky's state highway bond proposal accounts for $75,000,000, while in North Carolina, South Carolina, Montana and Arizona $26,500,000 in state bond issues for soldiers' bonuses, port development, roads and public buildings were turned down. Among the larger cities, we find the most prominent defeat of a bond program was in Columbus, Ohio, where every item in a $10,100,000 program failed to obtain a majority of the ballots.

Bond election results so far received indicate that in the western agricultural states, the tendency to refuse approval of bond issues is more pronounced than in Eastern industrial sections.

Among the successful issues, the largest was the state of Illinois' $100,000,000 road bond authorization. Other states obtaining borrowing authority from the voters are New York, Maryland and New Jersey. Many prominent cities also appear in this list.*

An outstanding feature of the election returns is the voting of bonds for schools by relatively small communities in Pennsylvania. It is suggested that this contemplated borrowing is the result of recent inflation of valuations for tax purpose of the coal lands located in certain sections of the state. Where coal lands constitute the bulk of the real estate valuation of a community, it is easy to understand the readiness of the inhabitants of that district to vote bond issues which must be repaid through taxation of the absentee coal land owners.

Omitting the large items referred to above, here are some of the smaller places and the amounts which they have voted to borrow:

Jefferson Co., Ala.; various purposes	$2,500,000
Lakeland, Fla.; sewer and street improvements	775,000
Ormond, Fla.; street paving and water-works	205,000
Richmond Co., Ga.; schools	350,000
Marion Co., Ill.	110,000
Pontiac, Ill.; bridge	20,000
Scott Co., Iowa, hospital	80,000
Ashland, Ky.; water-works, schools and city building	800,000
Central City, Ky.; city hall, jail, and street improvements	100,000
Russell, Ky.; city hall	50,000
Whitesburg, Ky.; street paving and bridge	25,000
Cadillac, Mich.; schools	53,000
Harrison Co., Miss.; sea-wall protection	2,000,000
White Plains, N. Y.; various purposes	910,000
Grand Forks, N. Dak.; dam and reservoir	75,000
Champion, Ohio; school, gymnasium and auditorium	60,000
College Corner, Ohio; school	60,000
Easton Township, Ohio; school	100,000
Homer, Ohio; school	45,000
Marion, Ohio; sewage disposal plant	20,000
New Philadelphia, Ohio; school	375,000
Vermillion, Ohio; school	200,000
Vernon Township, Ohio; school, gymnasium and auditorium	30,000
Clatsop Co., Ore.; school	100,000
Lakeview, Ore.; sewers	10,000
Multnomah Co., Ore.; bridge	500,000
Carnegie, Pa.; street improvements	225,000
Carrick, Pa.; borough bonds	200,000
Crafton, Pa.; grade crossing and street improvements	284,000
Easton, Pa.; school	270,000
East Berlin, Pa.; water-supply	8,000
Farrell, Pa.; sewage disposal plant	100,000
Hanover, Pa.; refunding	100,000
Lehighton, Pa.; street improvements	125,000
New Castle, Pa.; sewage disposal	300,000
Petersburg, Pa.; school	32,000
Scottdale, Pa.; school	100,000
Sharpsville, Pa.; sewage disposal plant	85,000
Steelton, Pa.; municipal building	50,000
Westview, Pa.; street improvements	45,000
Williamsport, Pa.; school	800,000
Zelienople, Pa.; high school	60,000
Amherst, Va.; water and light	79,000
Fairfax Co., Va.; school	75,000

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* EDITORIAL NOTE.—For some of the more important of these bond issues, see "Results of November Election Referenda," page 613 of this issue.

Combined Autocar gas and electric fleet owned by the Dist. of Columbia

One of the District's 4-cylinder, 4- to 6-ton gas Autocars

One of the District's Autocar electrics with trash body

IN September of 1922. the District of Columbia purchased one of the finest Autocar electrics to be put on the market. Although at that time the Autocar electric did not have a proved performance record behind it, the executive commissioners of the District did not hesitate to place their order. They had been Autocar users for a period of thirteen years.

Today they operate a fleet of seventeen Autocars, comprised of fourteen gas Autocars and three Autocar electrics.

Several of these Autocars, including the three electrics and some of the gas Autocars, are used for house to house garbage and trash collection. The electrics work in the more congested districts, where stopping and starting is almost a continuous performance. The gas Autocars collect ashes and garbage on the longer and more thinly populated routes where, in spite of frequent stopping and starting, some of them cover nearly fifty miles a day. One of the 4- to 6-ton models in this work collected forty-nine loads in a month although it had to travel 1,135 miles to do so.

Another of the District's 4- to 6-ton gas Autocars is equipped with a 1,200 gallon street flusher which is worked on two eight-hour shifts a day. This truck flushes an average of 135,000 square yards of pavement on the day shift and 190,000 square yards on the night shift.

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More Letters on Safety at Railroad Crossings

Action in Indiana

To the Editor of THE AMERICAN CITY:

In appreciation of your kindly interest and aid in the promotion of the Grade Crossing Safety Conference for the state of Indiana, held in the State House October 14 and 15, I am enclosing to you herewith a copy of the resolutions adopted by that conference. The adoption was without a dissenting vote.

The membership of this conference was made up of two representatives from each of the steam railroad and electric railroad companies, operating in whole or in part in Indiana, together with two representatives from each of several civic organizations, such as the State Chamber of Commerce, Farm Federation Bureau, Rotary International, Kiwanis, and others. The total membership present was 142, representing interests pertaining to all points of view of grade crossings. The program was made up so that all these different interests would be presented to the convention. The discussions were good and the interest was all that could be expected.

F. T. SINGLETON,
Commissioner, Public Service Commission of Indiana.

EDITORIAL NOTE.—The resolutions referred to by Commissioner Singleton recommend the creation of a Department of Safety of the Public Service Commission of Indiana, at the head of which shall be a member of the Commission to be designated "Commissioner of Safety"; and the appointment by such Commissioner of an advisory committee of seven persons, not members of the Commission. The following steps, among others, for the reduction of grade crossing accidents are recommended in the resolutions:

"That the elimination of grade crossings should proceed in an orderly and expeditious manner, so far as financially practicable, and the creation of new crossings should be avoided wherever possible.

"That the Public Service Commission shall have the power to require railroad companies to install and operate flash-light signals, signs, or other modern signal devices at railroad crossings over highways in the country, and Common Councils of cities and Boards of Trustees of towns shall have power to require the installation of like devices at such crossings in cities and towns.

"Where grade separation is not now already provided for by law, that highways that cross and recross tracks should be eliminated and adjacent crossings consolidated wherever possible.

"A safety zone, not in excess of 300 feet from the nearest rail, should be prescribed at grade crossings, within which unnecessary obstructions on adjoining land to the view of the traveling public and distracting commercial signs should be removed, and that new buildings and other structures thereon, constituting actual or constructive obstructions to the view, should be only constructed or erected upon permit, first obtained therefor, from the Public Service Commission.

"That the Legislature shall invest the Public Service Commission of Indiana with the power of eminent domain for straightening and relocating highways or for the purpose of removing buildings, trees, or any other obstruction along such highways, provided that the same shall not apply to highways within incorporated towns or cities, and in towns and cities the Boards of Public Works, the Common Councils or the Boards of Trustees of towns shall have like power to condemn property for the removal of such obstruction.

"That a 'Stop, Look and Listen' law be enacted, empowering the Commissioner of Safety, after a survey thereof, to designate certain dangerous grade crossings, at which the vehicular traffic shall stop, and that at all grade crossings, except such as are protected by watchmen, gates or mechanical or electrical warning signals, approved by the Public Service Commission, the motorist shall be required to proceed in low or intermediate gear.

"That the principles of safety be included in the curriculum of every school.

"It is the unanimous opinion of this committee that one of the greatest menaces to safety upon the highways of the state is that of the operation of automobiles by drunken drivers; we are of the opinion that legislation touching this subject is probably already sufficient, but that most of this violation is due to a failure of the judges and juries to punish offenders with sufficient sentences, and we therefore recommend to the prosecuting offices and courts that such violations be punished with greater rigor, and that it is also the duty of all citizens to report such offenses and assist in their prosecution.

"That the above resolutions apply alike to grade crossings of steam and interurban railroads."

A Full-Stop Rule Should Sometimes Work Both Ways

To the Editor of THE AMERICAN CITY:

I am in accord with your "Program for Fewer Deaths at Railroad Crossings," with the exception of section 6 relating to automobiles coming to a full stop before railroads crossing at grade. This should work both ways; that is, both the automobile and the train should be required to stop under certain conditions.

In the state of Delaware, which has a length of 100 miles and an extreme width of 36 miles, the main highways approximately parallel the main line of the Delaware Division of the Pennsylvania Railroad, and cross the railroad branch lines; while the feeder or secondary highways approximately parallel the railroad branch lines and cross the main line. The following are instances of highways crossing at grade at which trains might well, and perhaps should, stop:

Main highway crossing railroad branch lines.—(1) At Corbitt, on branch line twelve miles long; no towns except at termini; six trains of two or three cars daily. (2) Near Milford; six passenger and four freight trains daily. (3) Near Ellendale; two mixed trains daily.

Feeder highways crossing railroad main line.—At crossings which are at or near depots where trains make regular stops. Where crossing is beyond depot, trains should stop short of crossing. Where depot is beyond crossing, trains should stop short of crossing, and then pull clear of it and stop at depot. Because of the nearness of the crossing to the depot, train traffic would be little delayed.

No doubt there are similar conditions throughout the country which make it more desirable for the train to stop for the highway than it is for the automobile to stop for the train. Perhaps those who advocate that the automobile stop for the railroad have in mind the old-fashioned idea that the railroad should receive consideration above all other traffic.

I. PAUL JONES,
Secretary, Delaware State Highway Department.

[For THE AMERICAN CITY'S "Program for Fewer Deaths at Railroad Crossings," and other letters on the subject, see page 185, September, 1924, and page 432, November, 1924.]

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The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

Extent of Municipal Control Over Streets

LIKE other municipal powers, authority in a city to control the use of streets is not inherent, but depends upon express or implied grant by statute or charter. And it seems that, as declared by the courts of New Jersey, primary power of a state legislature to control the use of streets may be resumed at will. (58 Atlantic Reporter, 71.)

When the state delegates control to a city, the city becomes vested with as full power as the state could exercise, to the extent that authority is delegated. (136 Illinois Reports, 489.)

Municipal Control Over Laying Sidewalks

In several instances, courts of last resort have declared the existence of power to compel abutting property owners to construct at their own expense sidewalks of specified kinds. For example, in an Indiana case (150 Indiana Reports, 814), it was decided that an incorporated town could enjoin a property owner from laying a brick sidewalk, where one of stone was required by ordinance. The Court said:

> "Such owner certainly has no right to undertake to improve a public street permanently or any part thereof, according to his own volition, and thereby interfere with or disturb the public authorities in the exercise of the powers with which under the law they are vested, and are endeavoring to carry into effect."

The decision is in line with an earlier holding by the Appellate Court of the same state (49 Northeastern Reporter, 474) that the authority of a city over the streets extends over the sidewalks as a part thereof.

Use and Control of Land Dedicated to Streets

Land used as a street is primarily acquired to enable the public to travel from one place to another, notes the New York Supreme Court for Erie County in the recent case of Cary vs. Schwab, 205 New York Supplement, 903. The strip properly can be divided into roadway and sidewalk, and the space between the paved or traveled portion of the street and the sidewalk or building line can be used for proper street uses, such as maintaining grass plots, planting shade trees, placing stepping-stones, hitching-posts, etc., so long as they do not hinder travel. The municipal authorities may be and are legally bound to make such changes in the areas devoted to street and sidewalk traffic as changing conditions require.

The same opinion recognizes that an abutting property owner has a qualified interest in trees in front of his premises to such extent that he can recover damage to his property caused by wrongful interference with the same. But he has no such propriety interest, the Court adds, as to prevent the city from improving the street by removing the trees, so as to afford the full benefit to the public which was contemplated when the strip of land was acquired for street purposes.

> "The municipal power . . . is liberally construed so as to effect the object of the grant, and authorizes control of the entire length and breadth of the street; also above and below the surface as far as any proper street use may require, but not beyond the street line." (28 Cyc. 849-850.)

Control of Streets Cannot Be Delegated

A decision illustrating the generally recognized legal principle that legislative powers vested in a certain body cannot be delegated was handed down by the Illinois Supreme Court in the case of City of Chicago vs. Trotter, 26 Northeastern Reporter, 359. Overturning an ordinance which purported to forbid parades, etc., upon streets, without police department permission, the Court declared:

> "The ordinance . . . seems to proceed upon the theory that some of such demonstrations are to be allowed . . . and others prevented. It does not, however, fix . . . the conditions under which the parades and processions will be unlawful. It merely leaves it to the discretion or caprice of the superintendent of police to imperatively prescribe who shall be permitted to gather together in such processions, and who shall not, to dictate that the members of one political party, or of one religious denomination, or of one civic society may, and the member of another . . . may not, have such parades or processions. . . . It is subversive of the liberty of the citizen, and outside the domain of the law, that authority so arbitrary should be lodged in one individual. The powers that were granted by the state, and that are relied upon by the municipality, were delegated to the city council; and that body could not transfer its legislative prerogatives, and

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the public trust which was imposed upon it, to a mere executive officer."

Use of Sidewalks for Private Purposes

That, excepting as to the natural rights of abutting property owners, a city has no power to authorize the use of streets and sidewalks for private purposes disconnected from public travel, etc., is a proposition of law that has been laid down by the courts frequently.

A concrete example is afforded by the recent decision of the Louisiana Supreme Court in the case of Viering vs. N. K. Fairbanks Co., 100 Southern Reporter, 729. It was there decided that a municipality could not validly empower a manufacturing company to erect and maintain on the sidewalk in front of plaintiff's premises posts supporting guy-wires holding a smoke-stack in position.

But it was decided that since plaintiff had permitted the company to maintain for thirty years such posts on his own property, a vested right to maintain them was acquired.

Solicitation of Business on Streets

An ordinance forbidding the soliciting of business on a street or public sidewalk must be general in its operation in order to be valid, according to the decision reached by the Missouri Supreme Court in the case of Lerner, 218 Southwestern Reporter, 331. The Court annulled a St. Louis ordinance forbidding one to solicit persons on a street or sidewalk to buy goods of the same kind dealt in by one having a place of business abutting upon such place. The Court said:

> "Instead of prohibiting the general personal solicitation of persons for business purposes upon the streets and sidewalks of the city, its application is limited to the prohibition of such solicitations to persons in like lines of trade in front of the store or place of business of a competitor. . . .
>
> "Certainly, if it be an ill requiring legislative supervision to regulate the solicitation of business upon the streets and highways within the limits prescribed in the ordinance, then it must follow that it is equally an ill to solicit business elsewhere upon any of the thoroughfares of commercial activity in the city."

Temporary Playground on Street

But the Arkansas Supreme Court very lately recognized the right of village authorities to temporarily rope off part of a street for use in providing a baseball ground for school children. (259 Southwestern Reporter, 396.)

Consent of Property Owners to Parking Autos

And the Kansas Supreme Court has ruled that passenger-carrying vehicles may be licensed to stand at such places along street curbs as may be consented to by abutting property owners. (189 Pacific Reporter, 969.)

No Compensation to City for Poles and Wires

It has been ruled in Vermont that a city has no proprietary right of compensation for the use of streets by an electric power company for a line of poles and electric wires, the right of granting the privilege being primarily with the State Legislature. And where a company had occupied streets before the city's charter was so amended as to empower the city to regulate the use of the streets, the company had such vested rights as to preclude the city from requiring setting apart of the top gain of each pole for city use, as a condition to continued maintenance of the poles in the streets. (106 Atlantic Reporter, 513.)

Abutter's Rights in Subsurface

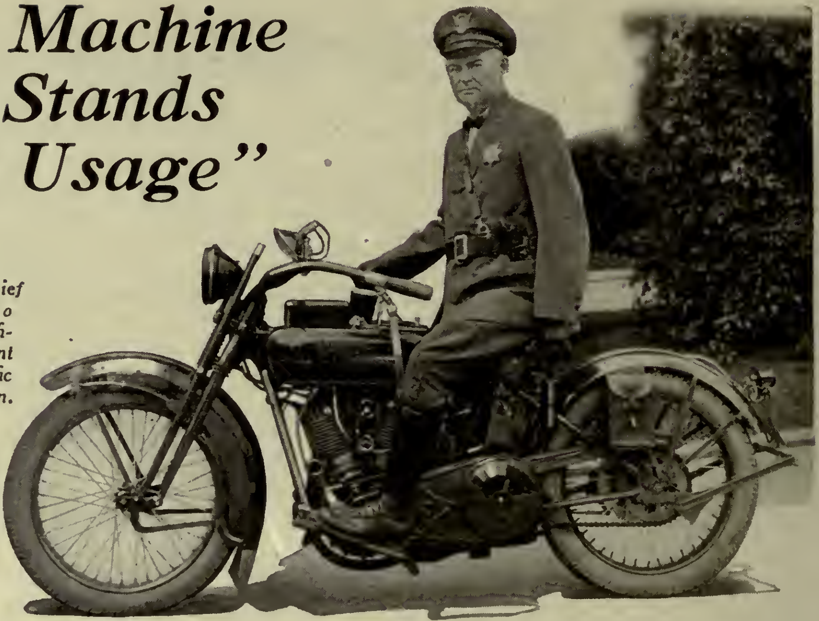
A city may require abutting owners to secure permits before making any opening in a sidewalk, and to see that proper safeguards are thrown about the work, and that public use of the sidewalk is not unreasonably interfered with. The city may also regulate how excavations in the subsurface of the street shall be made by an abutter, and how trap-doors, etc., shall be constructed. But it may not arbitrarily refuse to grant a permit, nor, under the guise of regulation, place an additional burden on the abutter, or make regulations that would in effect deprive him of his rights in the subsurface. (82 Southern Reporter, 775.)

Use of Streets by Jitneys

It seems established that cities cannot prevent reasonable use of streets for interstate or interurban traffic, but that ordinarily a city may regulate or prohibit the use of streets for intracity traffic by so-called jitneys, etc. In an illustrative case (Davis vs. City of Houston, 264 Southwestern Reporter, 625), the Texas Court of Civil Appeals at Galveston lately said:

> "The distinction between the ordinary use of streets by a citizen in traveling or transporting his property thereon in the usual course of life and business, and their use as a place for carrying on a private business such as operating for private gain jitneys or other means of transportation thereon, is obvious and is recognized by all the authorities. The ordinary use of the streets by the citizens is an inherent right which cannot be taken from him by the city and may only be controlled by reasonable regulation, while the right to use the streets for conducting thereupon a private business of any character is not an inherent or vested right and can only be acquired by permission or license from the city, and the power of the city to withhold such permission or license is an essential and necessary prerogative of municipal government."

"Only Machine That Stands Hard Usage"



T. M. Ryan, Chief of Sacramento County Traffic Officers, and President of California Traffic Officers' Association.

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Results of November Election Referenda

AMONG the many interesting reports which have reached THE AMERICAN CITY of referenda results at the election on November 4 are the following:

WISCONSIN.—Adopted a municipal home rule amendment to the state constitution. It provides that "Cities and villages organized pursuant to state law are hereby empowered to determine their local affairs and government, subject only to this constitution and to such enactments of the Legislature of state-wide concern as shall with uniformity affect every city of every village. The method of such determination shall be prescribed by the Legislature."

ARKANSAS.—Adopted a home rule constitutional amendment, Section 1 of which reads: "No local bill shall be passed by the General Assembly of the state of Arkansas. Counties and municipalities shall have the power of legislation as to all local and special legislation of every character in and for their respective municipalities and counties, the manner to be provided by law, but no local legislation shall be enacted contrary to the constitution or contrary to any general law of the state." The amendment also makes provision for the exercise of initiative and referendum in local legislation.

ILLINOIS.—Approved a bond issue of $100,000,000 for road improvements.

MICHIGAN.—Voted favorably on an initiative proposition for a 50 per cent increase in motor licenses, a two-cent tax on gasoline, and a speeding-up of the state road-building program.

MASSACHUSETTS.—Voted to continue Daylight Saving as a state-wide measure.

NEW YORK STATE.—Approved a bond issue of $15,000,000 for the creation of a comprehensive state park system.

MICHIGAN.—Defeated a proposed constitutional amendment which would have required all children between the ages of seven and sixteen years to attend a public school until they had graduated from the eighth grade.

CINCINNATI, OHIO.—Adopted a new charter providing for the city manager plan with proportional representation. (See page 534 of this issue.)

PHILADELPHIA.—Authorized the spending of $39,850,000 for a great variety of improvements.

LOS ANGELES.—Adopted a Major Traffic Street Plan as the official municipal plan for the future laying-out, opening and widening of streets, avenues and boulevards throughout the entire city, as well as correcting, wherever possible, past street-planning errors; and approved a bond issue of $5,000,000 for starting the work.

CAPE MAY and OCEAN COUNTIES, N. J.—Approved the creation of county libraries. Such libraries are already in operation in Burlington, Morris, Camden and Monmouth Counties. Their cost is one-fifth of a mill on the assessed valuation of the districts served.

ST. LOUIS, MO.—Approved the building of a new court-house, in accordance with the plans for a municipal plaza and public building group set forth by the City Plan Commission. (See page 603 of this issue.)

LOUISVILLE, KY.—Authorized $5,000,000 of grade-crossing elimination bonds and an equal amount of sewer bonds.

EAST BAY MUNICIPAL UTILITY DISTRICT, CALIFORNIA (comprising the cities of Oakland, Berkeley, Alameda, Piedmont, Richmond, San Leandro, Albany, Emeryville, and El Cerrito).—Authorized $39,000,000 in bonds for developing the first unit of a new source of water-supply.

SAN FRANCISCO, CALIF.—Defeated a proposal to increase the Mayor's salary from $6,000 to $12,000 a year, but approved salary increases of $1 a day for employees of the Fire and Police Departments. Also approved a charter amendment providing for the purchase and maintenance of playgrounds and recreation centers; the cost to be not less than 5 nor more than 7 cents upon each $100 assessed valuation of property. Another of the several amendments adopted establishes a revolving fund for street work that is to be paid for by selling 15-year bonds.

PORTLAND, ORE.—Adopted a zoning ordinance and several charter amendments, providing for the creation of special street-lighting districts under the local improvement code; voting $500,000 additional (county) bonds for constructing the Ross Island and Sellwood bridges; and authorizing for general municipal purposes an additional tax of 2.2 mills over the 8 mills already authorized by the charter.

CHICAGO, ILL.—Approved $1,000,000 in bonds for the extension and rehabilitation of the street-lighting system; $3,000,000 for the city's share of certain street-widenings, and $3,000,000 for enlarging and completing the stadium in Grant Park.

CLEVELAND, OHIO.—Authorized an additional levy of 1/10-mill for the work of the Metropolitan Park Board, which has charge of the purchase, development and maintenance of a series of rural parks and forest reservations around the city of Cleveland. This additional levy will add to the Board's income about $225,000 annually.

BALTIMORE.—The county approved a bond issue of $1,500,000 for the construction of thirty elementary schools; and the city authorized five loans which included a $10,000,000 sewer loan, $7,000,000 for paving, bridge construction and abolition of grade crossings, $2,000,00 for a municipal office building, $1,500,000 for an extension of the city's electrical conduit system, and $1,000,000 for the erection of a municipal art museum.

DAYTON, OHIO.—Authorized $4,600,000 for schools and $8,600,000 for general municipal construction.

GREENVILLE, S. C.—Approved $2,000,000 of water-supply bonds.

NASHVILLE, TENN.—Water-works extension bonds of $3,000,000 approved.

AKRON, OHIO.—Approved a $3,500,000 sewer bond issue and $2,500,000 for school buildings, sites and athletic facilities; and defeated a proposal of $3,000,000 for a municipal bus system.

OMAHA, NEBR.—Authorized a bond issue of $250,000 for acquiring approximately 600 acres of land needed for a system of small parks overlooking the river; and $2,500,000 for constructing, remodeling and equipping school buildings.

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There are no idle hours for the Fordson. It furnishes dependable, low-cost power for road work, heavy hauling, street scraping, sprinkling, garbage collection and removal, lawn mowing, park and street maintenance, wood sawing, snow removal—in fact for every municipal power job! Snow removal is only one of the many important power jobs done better with Fordson. You can depend on Fordson to keep the "thoroughfares" open at a big saving in time, money and labor.

The experience of Windsor, Canada, will interest you. J. E. Hillman, Commissioner of Public Works, says: "In city snow removal, a Fordson Tractor hauling a scraper can remove 3 times as much snow as a team pulling a scraper. One Fordson with driver and helper actually does the work of 3 teams, 3 drivers and 3 helpers.

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Items translated from "Tablettes Documentaires Municipales" by Stephen Child, 538 Merchants Exchange Building, San Francisco, Calif., to whom requests for further information regarding this source of civic documentation should be addressed

The New Land Policy of Germany. 33.3 (43)

The German Reich has recently passed a so-called "Home State" (Heimstatten) Law. These "Home States" are really large colonies for state agents, officers, pensioners, or beneficiaries under the shortage of employment conditions. Their pensions are capitalized, and in exchange for this capital the state places at the disposition of each a house and a relatively large extent of land; usually uncultivated heath, which the new owner is expected to clear, grub-up and cultivate, in order that he may thus find a new means of subsistence. These "Home States" form entire villages, and there are now several in the province of Hanover.

The new law, divided into three parts, provides for the organization of the authorities of such "Home States"; regulates the particular laws which will govern them, and also regulates the particulars of succession in ownership of land.

The Engineering Basis of Town Planning. 71

Professor Humphries of the University of Birmingham, England, has recently discussed what he terms the three fundamental technical factors of city planning—first, the system of sewers, next the highways, and then other means of transportation. As to sewers, he maintains the necessity of preserving the natural watercourses and of cooperation of various communities in the treatment or disposal of sewage. He refers to the creation of the Midland Regional Plan Commission and affirms that it would be difficult to estimate the enormous advantage in the saving of public funds that such a commission would have been able to realize if it had only been organized years ago.

Regional Planning Procedure. 71.2

At a City Planning Conference held at the British Empire Exposition at Wembley, near London, G. L. Pepler maintained that before elaborate planning, a regional survey should be made to determine what sort of city planning policy is best suited to the region. This policy or program and a preliminary plan should then be presented, first, in a schematic form setting forth all that should be done eventually, what is possible to do immediately, and what may be reserved for a later day. He would develop a regional plan which would dominate all the constituent parts; completing each one then as to its individual details, rather than attempt to adjust these details (each one of which should be studied separately) to the general plan.

City Planning. 71.2

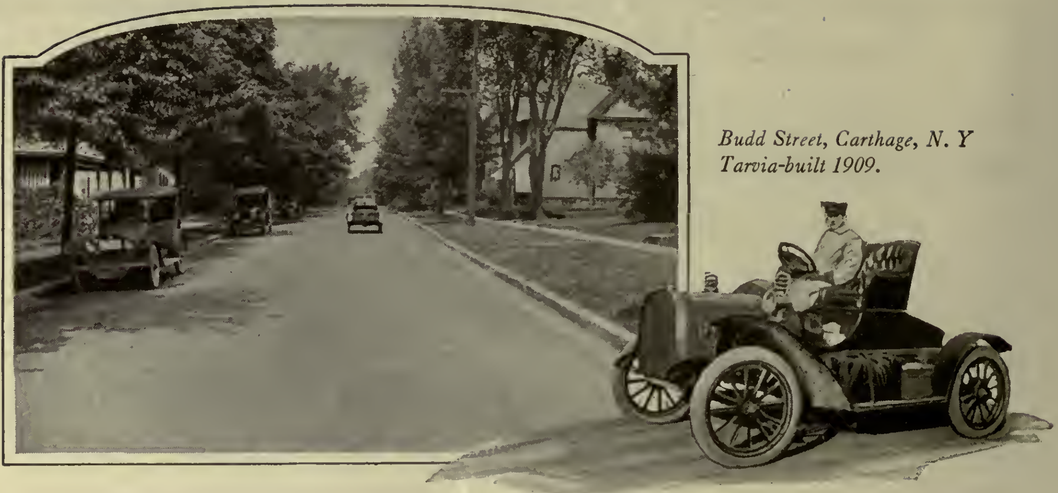
Professor Adshead of the University of London, at the Wembley City Planning Conference, stated that it is necessary, in the first place, in regard to city planning, to concentrate all efforts to prevent the building of more than twelve houses to the acre, with the exception of built-up portions of existing cities, where similarity with the best of existing arrangements would be permitted. In rural districts he would have no more than eight houses to the acre. In the second place, he urges the importance of taking care that groups of new houses are not too large and do not exceed a certain number. In planning for the extension of principal streets, those opening out from quarters already built up should maintain an architectural harmony with the older portions, as has been done in Rome, Paris and Brussels.

City Planning in Central Germany. 71.31 (43.2)

The housing and town planning problems of Magdeburg, Germany, are now under consideration, and in planning for the arrangement of new residential districts, considerations of a social order have been placed first, before economic ones. First, the density of urban population should not be allowed to pass a certain limit. Second, to each inhabitant should be given the possibility of enjoying the open country, which should be made readily accessible. The general plan of Magdeburg determines definitely the outlines of the city in the form of a star, including several suburbs, in such a way that open spaces in the shape of angles or bays with forests and other verdure lead toward the center of the town. Beyond this determined outline or limit, the extension of the city will be arranged in the form of colonies on the right bank of the Elbe, the left bank, being very fertile, to be reserved for agriculture. Arrangements are made in the new plan for convenient new allotments, for zoning and for open spaces. Magdeburg is evidently to become a true garden city when these plans are executed.

Housing and Other Improvements at Bradford, Yorkshire, England. 61.438.3 (42.74)

Bradford has a very unhealthy slum quarter known as White Abbey, which it is now proposed to improve, necessitating an expense of £235,766. This district covers 15 acres, of which 10 are particularly unhealthy, and to which the remaining 5 acres are annexed in order to permit the realization of a practical and complete plan. The district now includes 575 houses, with a density of 58 houses to the acre, as against 4 to the acre, the average density of the remainder of the city. During the last nine years the number of tuberculosis cases in this quarter attained the high figure of 45 to the 1,000, while for the remainder of the city the figure was only 14.3 to the 1,000. This White Abbey district in proportion to its extent sends to the Municipal Hospital 2½ times more cases of illness than all the rest of the city. The district is going to be rearranged with a view to the future needs of the city, and the necessary land is to be taken for widening White Abbey Street to 75 feet. The frontage of this street will be reserved for offices and shops.



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Public Water Supplies.—By F. E. Turneaure and H. L. Russell, Dean, College of Engineering, and former Professor of Bacteriology, University of Michigan, respectively; with a chapter on Pumping Machinery, by D. W. Mead, Professor of Hydraulics and Sanitary Engineering, University of Wisconsin; and three chapters on Quality of Water Supplies, revised by C. M. Baker, State Sanitary Engineer of Wisconsin. Third edition, revised. John Wiley & Sons, Inc., New York. 1924. XVI + 766 pp. Illustrated. $6.00.

This book, which has been standard since its first edition appeared in 1901, brings up to date the very broad subject of public water-supplies, their qualities, and the means of procuring and distributing them. The second edition contained considerable revision in the treatment of the subject of filtration, dealing particularly with the development of rapid sand filtration. The present edition contains no fundamental changes in this field, but does contain a large amount of new information and important improvements. Special attention is given to the consumption of water, stream flow, filtration, chlorination, the quality of water-supplies, reinforced concrete in waterworks construction, and pumping machinery, with additional information on these subjects. The bibliography has been revised and brought up to date.

Municipal Canada.—British Empire Exhibition Number. Published by the Municipal Publishing Co., Limited, Montreal, Canada. 1924. 191 quarto pp. Many illustrations.

A pictorial gazeteer of urban and rural life in Canada, published for the express purpose of placing before the British public the various opportunities to be found in the nearly 4,000 Canadian municipalities, and thereby attracting capital and settlers. Describing the resources, facilities, industries, advantages and administration of the municipalities and provinces of Canada, with interesting references to individual public service.

Handcraft for Home, School, Playground and Summer Camp.—Published by the Playground and Recreation Association of America, 315 Fourth Avenue, New York. 32 large mimeographed pp., with many full-sized patterns. $1.25.

A delightful and stimulating collection of designs and instructions which will enable boys and girls of different ages to make a variety of articles with common materials and few and inexpensive tools. Many of the articles have actually been made by children in city playgrounds in the Middle West. The working kit is described and all essential hints and helps are given for using the tools and materials. The articles include toys of cardboard, cork, wood, and tin, and range from furniture and racing autos to birdhouses and kites. A bibliography is given which will lead to more advanced work.

Bulletin of the National Conference on Outdoor Recreation.—No. 1 (September 1, 1924), issued for the information of the members of the Conference and of the American public. The Conference was organized in May, 1924, to serve as a clearing-house through which the states, municipalities, quasi-official and unofficial agencies on the one hand, and the Federal Government on the other, may best cooperate with each other to make available to the people the opportunities and facilities for wholesome outdoor recreation, physical training, and nature study essential to their spiritual, moral and physical welfare. (Apply to the Executive Secretary of the Conference, L. F. Kneipp, Room 2034, New Navy Building, Washington, D. C.)

The Public School Debt in Illinois.—A report reviewed and presented by the Educational Finance Inquiry Commission under the auspices of the American Council on Education, Washington, D. C. The report was prepared for the Commission by George W. Willett, of the Illinois staff. Published by The Macmillan Company, 64 Fifth Avenue, New York, N. Y. 1924. XV + 97 pp. Diagrams, tables. "Illinois is not peculiar so far as the problem of public school debt is concerned, and school debt is but one element in municipal debt. It is, therefore, hoped that the volume will be of service to school and municipal officers in other states, to students of public finance in general, and to unofficial and non-professional readers who are interested in the financing of public enterprises." $1.00. (Apply to the publishers.)

Public Finance.—By Harley Leist Lutz, Ph. D., Professor of Economics in Leland Stanford, Jr., University. D. Appleton and Company, New York. 1924. XVI + 681 pp. $4.00.

This book seeks to bring together theoretical and practical knowledge—a study of principles and of experience in the collection and disbursement of public revenue. Public expenditure is treated first, as being one of the most important divisions of the subject. Revenue sources other than taxation are considered in the section preceding the one which is devoted entirely to the various forms of taxation. The special characteristics of public debts and the use of public credit are dealt with in the study of a special method of obtaining income. Public financial administration is the subject of the final section, describing the procedure by which government coordinates income and outgo—collects, keeps, appropriates, and expends public funds. The book is clear and interesting, and should find many readers and students outside of the classroom.

The Appraisal of Real Estate.—By Frederick Morrison Babcock, B. S. The Macmillan Company, New York. 1924. IX + 380 pp. Views, diagrams, tables. $3.50.

The third volume in the standard course in real estate outlined by the Joint Commission representing the National Association of Real Estate Boards, the United Y. M. C. A. Schools, and the Institute for Research in Land Economics and Public Utilities. The foundation and elements of real estate values are discussed as a basis for appraisal procedure and methods. The principles of appraising income-producing property and computing net income, the appraisal of residential and farm property and of lease equities are explained, and also the determination of depreciation and obsolescence. The final chapter is a study of the comparative values of city land. Working tables and formulas are given.

Criminology.—By Edwin H. Sutherland, Ph. D., Assistant Professor of Sociology, University of Illinois. J. B. Lippincott Company, Philadelphia. 1924. 643 pp. $3.50.

This volume is a text-book in the Lippincott Sociological Series, edited by Edward Cary Hayes, Ph. D., LL. D., Professor of Sociology, University of Illinois. It presents a study of the nature and extent of crime, and the policies used in dealing with crime and criminals, in their relation to the individual and to society. There are five chapters on the causes of crime. Other chapters deal with police and court systems, the taking of the law into the hands of the mob or the Klan, punishment and prisons, the release from prison, parole and probation, and finally—the dominant theme of the book—methods of reformation and prevention of crimes. References for wide reading are suggested.

Accounting for Building and Loan Associations.—By R. J. Bennett, C. P. A. Part of the special course in Accounting, Theory and Practice, published by the Bennett Accountancy Institute, Broad and Spring Garden Streets, Philadelphia, Pa. 45 pp. Covering in condensed but detailed form the vital points on building and loan association accounting, for ready reference by accountants, executives and building and loan members. Showing how all the phases of the business are conducted. $3.00. (Apply to the publishers.)

Parks and Playgrounds.—By Henry V. Hubbard, Professor of Landscape Architecture, Harvard University, Cambridge, Mass. American experience as to the requirements and distribution of parks and playgrounds as elements in the city plan. 25 pp. Illustrated. A revision of the author's paper given before the American National Conference on City Planning, for presentation at the International Town Planning Conference, in Amsterdam, Holland, 1924. Including a theoretical diagram showing the distribution of recreation facilities in an American city. Send 10 cents in stamps to Landscape Architecture, Cambridge 38, Mass.)

Country Planning.—A selected bibliography on this subject, published as Number 67 (October, 1924) of The Russell Sage Foundation Library, 130 East 22nd Street, New York, N. Y. 4 pp. Including a summary report of the Librarian for the year ending September 30, 1924. 10 cents. (Apply to the Librarian, Frederick Warren Jenkins.)

Why Grand Rapids, Mich., *uses* Trinidad Pavements

The Trinidad Lake Asphalt Paving on Cherry Street, Grand Rapids, Mich., was laid in 1902—nearly 23 years ago. Photograph above shows section from Jefferson Ave. to Madison Ave.

"Subject to heavy traffic, still in excellent condition. Repairs practically nil to date." These are excerpts from a Street Engineer's report on this pavement made June 22, 1924.

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Recent Progress in the Standardization of Fire Hose Threads.—Published by the Committee on Fire Prevention and Engineering Standards, National Board of Fire Underwriters, 76 William Street, New York, N. Y. 18 pp. Illustrated. A brief outline of the principal activities and more important developments to which much of the recent progress is attributed, with a table showing what has been actually accomplished in the work of conversion. Information that concerns every municipality, the railroads, shipping interests, manufacturers of fire-hose connections, and all others dependent on fire hose for protection. (Apply to the publishers.)

The Seasonable Acquisition of Parks and Other Public Open Spaces.—By Gordon J. Culham, of the Harvard School of Landscape Architecture, and Frederick M. Mayer, Jr., of the Harvard Law School. The Frank B. Williams Prize Essay, 1924, in the competition open to all schools offering recognized instruction in various phases of town planning. 14 quarto pp. in the October, 1924, issue of Landscape Architecture. A study of the limitations of the law, and of methods by which the procedure of acquisition of land for parks may be adjusted to present social and economic demands. (Apply to Landscape Architecture, Cambridge, 38, Mass.)

Traffic Regulations, Urbana, Ill.—This ordinance became effective November 1, 1924. It is patterned after the uniform state traffic law and is considered a wise and progressive step in simplifying traffic problems in Urbana. (Apply to C. B. Holmes, City Clerk.)

Regional Planning, West Middlesex, England.—Final Report of the Joint Town Planning Committee upon the Regional Planning Scheme. By Thomas Adams and Longstreth Thompson, town planning consultants, 121, Victoria Street, S. W. 1, London, England. 64 quarto pp. with folding map in pocket of cover. Tables, drawings. This detailed study is presented under divisions which consider the proposals for zoning; the selection of sites for civic and shopping centers; arteries of communication and transportation; joint sewage disposal; housing; and other questions involved in the orderly development of this region. 10s. 6d. (Apply to Ernest S. W. Hart, Hon. Secretary, West Middlesex Joint Town Planning Committee, Guildhall, Westminster, S. W. 1, London, England.)

Smoke Abatement.—Causes for Excess Smoke and Suggestions for Its Elimination. Prepared by T. V. Buckwalter. Issued by the Smoke Abatement Committee of the Canton Chamber of Commerce, Canton, Ohio. 15 pp. Drawings, tables. After a consideration of the economics of smoke abatement, and the causes and sources of smoke, the methods of smoke abatement in connection with domestic and industrial furnaces and locomotives are described, and illustrated by drawings. It is recommended that all educational means for securing smoke abatement in Canton should be exhausted before resorting to legal measures. (Apply to the Canton Chamber of Commerce.)

Suggested Tests for Food Inspector.—By F. A. Moss and Fred Telford. 10 quarto pp. Illustrated. In Public Personnel Studies, November, 1924. The difficulties in the work of public inspecting are outlined, and the qualifications which an inspector should possess in order to meet these difficulties successfully are stated. The tests suggested are largely for general intelligence, and also include specialized intelligence tests in terms of the duties of the inspector. (Apply to the Bureau of Public Personnel Administration, 26 Jackson Place, Washington, D. C.)

Legal Regulation of Bill-Boards.—Bulletin No. 15 (September, 1924) of the Massachusetts Federation of Planning Boards. 19 pp. Covering: the progress in bill-board regulation in Massachusetts to date; the state bill-board law as it now stands; the limitations of the law; the present state regulations; suggestions for municipal regulations; a proposed form of by-law; and the procedure in the adoption and enforcement of by-laws for bill-board regulation. (Apply to Arthur C. Comey, Secretary, Massachusetts Federation of Planning Boards, Cambridge, Mass.)

Proceedings of the National Conference on Outdoor Recreation.—The Conference was held in Washington, D. C., May 22-24, 1924. Senate Document 151. Interesting and valuable material. 244 pp. (Apply to Government Printing Office, Washington, D. C.)

Coach and Bus Operation in New York.—By John A. Beeler, Director, The Beeler Organization, public utility consultants, New York. 4 quarto pp. Illustrated. Reprinted from Electric Railway Journal of August 9, 1924. The Fifth Avenue Coach Company and the municipal busses give quite different kinds of service. In this article statistics of each are compared with those of surface lines in New York. (Apply to the Beeler Organization, 52 Vanderbilt Avenue, New York, N. Y.)

Fire Protection.—Two bulletins issued by the National Fire Protection Association, 40 Central Street, Boston, Mass.: "Clean Your Chimneys!" (No. E. 5a); "Precautions Against Freezing of Fire Extinguishing Appliances" (E-9). Each 4 quarto pp. Illustrated. Practical and timely suggestions. "If people can be educated to understand that it costs the city as much for the fire department to respond to a chimney fire as to a fire in the business district with $10,000 loss, it may interest them enough to make them look after their chimneys." "A very small 'freeze-up' may destroy the efficiency of a very large equipment." (Apply to the Association.)

Philadelphia's Government.—An organization chart and description prepared by Edward Thurber Paxton, specialist in governmental structure, of the Bureau of Municipal Research of Philadelphia. 1924. 39 pp. with folded insert of chart—"Governmental Organization of the City, County, and School District of Philadelphia, Including the County Courts." Separate diagrams on the chart show the relationship of the local government to various agencies doing public or semi-public work and receiving aid from the city treasury, and to portions of the state government in which the Philadelphia local government has a direct share. (Apply to the Bureau, 311 South Juniper Street, Philadelphia, Pa.)

Why Drink Milk?—Folder No. 3 issued by the Children's Bureau, U. S. Department of Labor. Illustrated. Showing that milk is the indispensable food for children, how to use it, and what milk to buy. (Apply to the Children's Bureau, Washington, D. C.)

Work-Study-Play Plan.—Majority and Minority Reports on the Work-Study-Play or Platoon Plan of Elementary School Organization. Based largely on visits to Detroit, Rochester, Pittsburgh, Gary, and Akron, where platoon schools are being operated. The Majority Report is in favor of the system, and discusses the advantages of the plan and the objections to it. 8 quarto pp. Apply to the Secretary, Board of Education, 650 South Clark Street, Chicago, Ill.)

The Public Dance Hall.—A report by the Public Dance Hall Committee of the San Francisco Center of the California Civic League of Women Voters. A report of much interest to recreation workers and park executives, prepared by Mrs. James Rorty. 14 pp. in Parks and Recreation for July-August, 1924. Part One takes up some general considerations involved in a comprehensive dance hall policy, covering a historical summary of the dance, the psychological considerations, and systems of regulating dance halls. Part Two deals with the experience of San Francisco—a very interesting account. It is followed by a supplementary report by Alice Barrows, Chief Supervisor of Dance Halls, San Francisco, covering the period from March 1, 1923, to January 1, 1923. 50 cents. (Apply to Parks and Recreation, American Institute of Park Executives, Minot, N. Dak.)

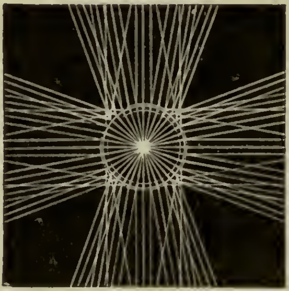
Zoning Procedure for Iowa Municipalities.—By Rolland S. Wallis, Municipal Engineer, Engineering Extension Department, Iowa State College. Bulletin 65 of the Engineering Extension Department, Iowa State College, Ames, Iowa. June 25, 1924. 20 pp. Dealing briefly with the legal powers of Iowa municipalities to zone, and explaining how zoning commissions are appointed and how they function, the value of expert knowledge, the preparation of the base map, the making of the survey, the zoning ordinances, its provisions, adoption and amendments; giving also additional sources of information. (Apply to the Engineering Extension Department.)

Modern Tendencies in Local Transportation.—By John A. Beeler, Director, The Beeler Organization, public utility consultants, New York City. A handy-size 11-page reprint from Electric Railway Journal, of September 27, 1924. Views, tables. Coordinated service, time-saving methods, parking control, faster schedules, and modern, light-weight, attractive equipment stimulate business and lower operating costs. (Apply to The Beeler Organization, 52 Vanderbilt Avenue, New York, N. Y.)

Union County Park Commission, New Jersey.—Report of the Commission for 1922. 30 pp. Illustrated. With chart showing area, population and ratables of Union County and of each municipality on a percentage of the entire county basis. Giving the history of the preliminary and the permanent Commission, and explaining the powers and functions of the latter, with an interesting report of its work. Also a folder entitled, "Information Regarding the Union County Park Commission," dated February 9, 1924. (Apply to the Commission, 286 North Broad Street, Elizabeth, N. J.)

Asymmetrical

The word that is revolutionizing street lighting.



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HERETOFORE street lighting units have distributed the light *symmetrically* around the lamp, and consequently a large part of the light has been wasted on house fronts and lawns.

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How to Get Useful Maps from the Government.—A single sheet listing and describing some of the most useful of these maps, which may be ordered from the Superintendent of Documents, Washington, D. C., or from the issuing department or bureau. The cost is low, and some are free. They include topographical maps of sections, prepared by the Geological Survey; maps of states in which there is public land, published by the Land Office; rural route maps, issued by the Post Office Department, and others. This list is prepared by The Kiplinger Washington Agency, Albee Building, Washington, D. C., as a special supplement to the Kiplinger Washington Letter. (Apply to the Agency.)

Administrative Consolidation in State Governments.—By A. E. Buck, of the National Institute of Public Administration, New York Bureau of Municipal Research. A compact and complete treatment of the movement for administrative reorganization and consolidation in state governments, with charts. Third edition, revised August, 1924. 47 pp. (Apply to National Municipal League, 261 Broadway, New York, N. Y.)

Electric Railways—Do We Need Them?—By B. C. Cobb, Vice-President, Hodenpyl, Hardy & Co., Inc. An address delivered at the eleventh annual Business Conference of the Babson Statistical Organization, Babson Park, Mass., August 8, 1924. 20 pp. The evolution of urban and interurban transportation is briefly outlined, with an analysis of the conditions affecting the public's riding habit due to the development of the automobile and the motor bus. It is recommended that street cars be given precedence over all other forms of street traffic, to relieve congestion. (Apply to the author, at 14 Wall Street, New York, N. Y.)

Standard for a Socialized Court Dealing with Sex Delinquents.—By George E. Worthington, Acting Director, Department of Legal Measures, American Social Hygiene Association, and Ruth Topping, Field Secretary, Bureau of Social Hygiene. Reprinted from the Journal of Social Hygiene for June, 1924. 26 pp. This pamphlet brings together what has been considered the best practice of specialized courts dealing with sex delinquents in Chicago, Philadelphia, Boston, and New York, as studied by the Bureau of Social Hygiene and the American Social Hygiene Association in cooperation. Judge Edward F. Waite, of Minneapolis, has said that the aim of a socialized court should be "not so much the adjudication of private rights as the performance of what are conceived to be community obligations." (Apply to the Association, 370 Seventh Avenue, New York, N. Y.)

The Water-Supply of Lawrence, Mass.—Conclusions and Recommendations about the City's Water-Supply. Prepared by Chester H. Wells, sanitary engineer. Approved by the Board of Directors of the Lawrence Chamber of Commerce, September, 1924. 8 pp. Recommending the immediate construction of a new covered slow sand filter and the rebuilding of the old open sections of the present filters, with other means of securing an adequate and safe water-supply. (Apply to the Chamber of Commerce, Lawrence, Mass.)

Motor Vehicle Fees and Gasoline Taxes.—By Henry R. Trumbower, Economist, U. S. Bureau of Public Roads. A review of the development of present-day policies in motor vehicle taxation. 9 quarto pp. Views, diagrams, tables. Published in the September, 1924, issue of Public Roads. The gasoline tax appears to be a permanent method of raising money for highway purposes. "It is distinctly a tax for highway service, and, considering the character of the service rendered in return, none of the rates now charged is excessive." (Apply to U. S. Bureau of Public Roads, Washington, D. C.)

The Sanitary Control and Operation of Tourist Camps.—By George W. Simons, Jr., S. L., Chief Sanitary Engineer, State Board of Health. Published by the Florida State Board of Health, Jacksonville, Fla. 1924. 20 pp. Illustrated. Tourist camps in Florida that comply with the regulations of the State Board of Health are publicly approved and certified. This pamphlet explains the standards of the Board, and shows the difficulties that are being overcome. It includes the West Palm Beach ordinance for an automobile tourist camp and regulating it. (Apply to Raymond C. Turck, M. D., State Health Officer, Jacksonville, Fla.)

Politics and Power.—By Guy E. Tripp, LL.D., Chairman of the Board of the Westinghouse Electric & Manufacturing Co. An address delivered before the Westinghouse Club, Wilkinsburg, Pa., October 16, 1924. Endorsing the view that electrical development will be best accomplished by private enterprise under proper governmental regulation and control. (Apply to Westinghouse Department of Publicity, East Pittsburgh, Pa.)

Recreation and Play in Oakland, Calif.—A bulletin of information issued by the Recreation Department of Oakland showing its facilities, activities and plans for the future. Pocket size. 32 pp. Illustrated. Including the provision for municipal golf, archery golf, industrial recreation, recreation centers, etc. Folding chart enclosed showing the interlocking organization of various city, county, national and private recreational agencies. (Apply to the Department.)

Municipal Reports Received

Brainerd, Minn.—Annual Report, Water and Light Department, year ending June 30, 1924

Chicago, Ill.—Annual Report, Mayor, 1924

Duluth, Minn.—Annual Report, Water and Light Department, 1923

East Cleveland, Ohio.—Annual Reports of City and of Library, 1923

Fitchburg, Mass.—Annual Report, Park Commissioners, 1923

Ipswich, Mass.—Annual Report, Water and Municipal Lighting Commissioners, 1923

Milwaukee, Wis.—Report, Common Council, 1923

New York, N. Y.—Annual Report, Board of Water Supply, 1923

Pasadena, Calif.—Annual Report, Light and Power Department, year ending June 30, 1924

Tacoma, Wash.—Annual Report, Public Library, 1923

Tallahassee, Fla.—Annual Report of City, year ending February 29, 1924

On the Calendar of Conventions

December 1-4.—New York, N. Y.
American Society of Mechanical Engineers. Annual meeting. Secretary, Calvin W. Rice, 29 West 39th Street, New York, N. Y.

December 3.—New York, N. Y.
National Highway Traffic Association. Annual meeting. President, Arthur H. Blanchard, 1026 East Engineering Building, University of Michigan, Ann Arbor, Mich.

December 11-13.—Indianapolis, Ind.
National Society for Vocational Education. Annual convention. Secretary, F. G. Nichols, Harvard University, Cambridge, Mass.

December 15-17.—Washington, D. C.
National Conference on Street and Highway Safety, called by Secretary Herbert Hoover. Address Department of Commerce, Washington, D. C.

December 16.—Washington, D. C.
National Civil Service Reform League. Annual meeting. Secretary, H. W. Marsh, 8 West 40th Street, New York, N. Y.

December 26-27.—Chicago, Ill.
National Community Center Association. Annual meeting. Secretary, LeRoy E. Bowman, 503 Kent Hall, Columbia University, New York, N. Y.

January 5-6.—Chicago, Ill.
International Association of Street Sanitation Officials. Annual conference. Secretary, A. M. Anderson, 10 South LaSalle Street, Chicago, Ill.

January 5-9.—Chicago, Ill.
American Road Builders' Association. Annual convention and Road Show. Secretary, Ethel A. Birchland, 37 West 39th Street, New York, N. Y.

January 12-14.—Boston, Mass.
American Society of Landscape Architects. Annual meeting. Secretary, Bremer W. Pond, 18 Tremont Street, Boston, Mass.

January 19.—New York, N. Y.
American Institute of Consulting Engineers. Annual meeting. Secretary, P. W. Henry, 111 Broadway, New York, N. Y.

January 21-23.—New York, N. Y.
American Society of Civil Engineers. Annual meeting. Assistant Secretary, C. E. Beam, 33 West 39th Street, New York, N. Y.

January 22.—Chicago, Ill.
American Forestry Association. Annual meeting. Executive Secretary, Ovid M. Butler, 1523 L Street, N. W., Washington, D. C.

February 24-27.—Detroit, Mich.
American Concrete Institute. Annual meeting. Secretary, Harvey Whipple, 1807 E. Grand Boulevard, Detroit, Mich.

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The Greatest Record in Truck Industry

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This speedy truck is helping municipalities to cut haulage costs, increase efficiency and keep well within their appropriations.

Hundreds and hundreds of Federal-Knights now in service all over the world are proving their greater economy and efficiency.

In a few short weeks Federal-Knight has won world-wide recognition as the outstanding value in the light truck field.

This is the *only* truck in the world with a Willys-Knight motor—the motor that *improves with use.* No valves to grind. No carbon-cleaning. 50% saving in upkeep. Amazing economy in gasoline, oil, and tires.

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News and Illustrations

Items of Interest to City, Town and County Officials, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Copper Service Pipe

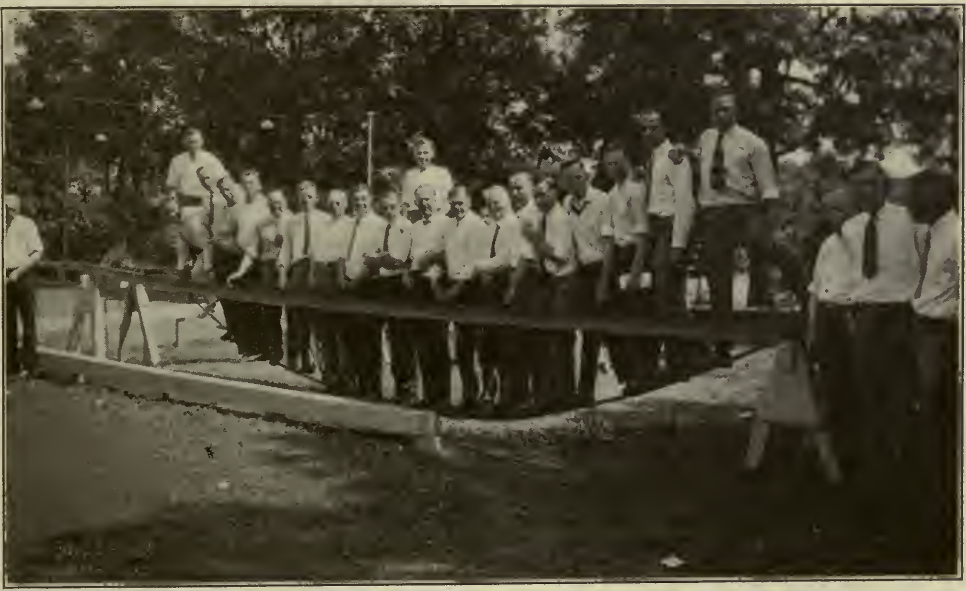
Water service pipe must withstand corrosion from the outside, since they are put where drainage from cinder fills may reach them and this drainage carries sulphuric acid in considerable amounts, and they are therefore liable to be quickly corroded. Again, iron pipe in many districts is subject to either corrosion or scaling inside, resulting in reduced area and ultimate failure. Extensive studies have been made of the value of copper pipe in resisting corrosion, which have shown universally that it is a valuable accession to water-works service pipes. Because of this, the Mueller Company, Decatur, Ill., has developed Mueller copper service pipe in sizes which replace iron service pipe from ½ to 2½ inches in diameter. These sizes are as follows:

I.P.S.	O.D.	Gage BWG	Test Pressure Pounds
½-inch	⅝	18	1,140
¾-inch	⅞	16	1,040
1 -inch	1⅛	16	780
1¼-inch	1⅜	16	630
1½-inch	1⅝	15	580
2 -inch	2⅛	14	520
2½-inch	2⅝	14	420

In the tabulation above are shown the outside diameters and gage of the copper pipe, as well as the test pressure. The inside diameters of the copper pipe are approximately equivalent to the iron pipe sizes, and the test pressures are one-fourth of the bursting pressures.

Since in some localities water or gas service pipe may be run in the same trench with the sewer pipe, though at a much higher level, and the trench may not be dug with a bench for the water-line, provision must be made for the settling of the pipe as the fill settles. This is usually taken care of with lead goosenecks, which serve perfectly with iron-size pipe. It has been found that with copper tube the line should be run directly from the main without any protection other than the ability of the tube to bend and stretch. The accompanying illustration shows one of the many tests which have been applied to this pipe.

A patented connection has been developed for use with Mueller copper pipe that makes possible the use of this service pipe under all conditions. The contact between the nut, copper pipe and spud is a line contact, thereby confining to a small area the total pressure exerted by tightening the nut, and thus tremendously increasing the pressure per square inch at the contact point, which results in a positive joint. Furthermore, this line contact reduces slightly the thickness of the pipe at that point, leaving the pipe its original thickness at the



NINETEEN MUELLER SALESMEN, COMBINED WEIGHT 3,440 POUNDS, STANDING ON COPPER SERVICE PIPE WITHOUT CAUSING A LEAK AT THE JOINTS

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THERE is an International Truck for every job and it is built for its job and built right. In twenty years of truck manufacture the Harvester Company has learned, not only how to build good trucks from the basic design through to final details, but how to fit them exactly for the hauling they are to do. International Trucks are made in six different capacities with wheel base and body equipment determined by the work for which the truck is to be used. International Trucks are serving their owners faithfully in every job imaginable. Called on for the hardest kind of work, they deliver it. You can expect the same of every International and you will not be disappointed. By standing up to severest service they are living up to a reputation — a reputation earned by other products of the Harvester Company for almost a hundred years.

International Heavy-Duty Trucks are built in 3000, 4000, 6000 *and* 10,000 *pound maximum capacities with bodies to meet every requirement. There is a Special Delivery of* 1500 *pounds capacity and a sturdy Speed Truck for loads up to* 2000 *pounds. Motor Coaches are supplied to meet every passenger transportation need. Upon request we will gladly supply you with information desired on any models, and the address of the nearest showroom where the full line is on display.*

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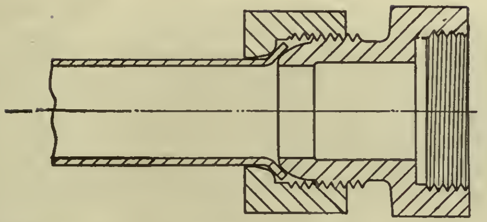


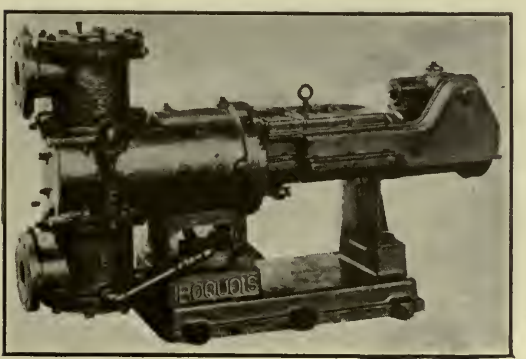
PATENTED CONNECTION FOR COPPER SERVICE PIPE

end, thus causing tremendous resistance against breaking the joint by pulling the tube out endwise. When a joint is made, it is only necessary to first cut the copper service pipe with a hacksaw to the length to be used, taking ordinary care to keep the cut fairly square. Then the small burr left by the saw is reamed out. This can be done with a scraper or pocket knife if desired. The coupling nut is then placed on the pipe, as this cannot be done after the pipe is flared out. The flanging tool is then oiled and inserted in the pipe. The exposed end of the flanging tool should be struck four or five fairly hard blows with a hammer or until the end of the pipe touches the recessed shoulder in the flanging tool. The flanging tool is then removed and the coupling connected, pulling the nut up tight and then loosening it slightly and pulling it up tight again. This completes the joint.

A Steam-jacketed Asphalt Pump

The increasing use of tank cars for the shipment of asphalt has created a demand for a simple asphalt pump with few wearing parts and one that can be operated without skilled attention. After a series of tests extending over a period of one year, the Barber-Asphalt Company, Philadelphia, Pa., is offering the new Iroquois steam-jacketed asphalt pump.

The manufacturers claim that this pump has the following distinctive features which insure long life and economy of operation; a minimum number of wearing parts in contact with the asphalt; large wearing surface to reduce wear; large, straight passages for asphalt, instead of narrow, crooked passages; simplicity of construction to insure low cost and maintenance; ease of operation with minimum of attendance; steam jackets covering all moving parts and packing, so that the pump can be started or stopped at will without clearing out, accessibility of all wearing parts, and absence of springs or other small, easily broken parts in the valve chambers on account of passing foreign matter, pieces of barrel staves, small pieces of metal, stone, sand, coal or other objects which sometimes get into the asphalt when it is allowed to flow over the ground.



STEAM-JACKETED ASPHALT PUMP

This pump is of the reciprocating type, having a single-acting plunger, which was adopted because it led to simplicity of construction and to placing wear on the plunger rather than on the piston rod. The ball type of valve was adopted because it obviates the necessity of springs within the valve chamber, provides the maximum possible amount of wearing surface, and large and straight passages for asphalt, permits the passage of large pieces of foreign matter, and reduces the number of wearing parts in the valve chamber to a minimum. The valve assembly is so designed that by removing the flange directly over the upper ball, both valves with the seats and cages can be removed through the top of the pump without disturbing any other part of the pump or its piping.

Steam jacketing is one of the essential features of the pump. The steam jackets cover all parts of the asphalt end, including the valve, the plunger and the plunger packing. With steam in the jackets, the pump can be stopped for an indefinite period without the necessity of blowing out or otherwise removing the asphalt in the pump chamber. The asphalt may be allowed to cool and solidfy in the pump chamber, and the pump may be started again by filling the jacket with steam until the asphalt is liquid.

The Iroquois steam-jacketed asphalt pump is furnished in three sizes, of 50, 100, and 200 gallons per minute. The materials entering into the construction of the pump are as follows: the steam cylinders are of close-grained iron; the piston rod is of steel; the plunger is of close-grained gray iron; the two ball valves are of bronze and are hollow; the asphalt valves and cages are of cast iron; the valve cage separator is of cast steel. All steam-jacketed parts are of special cast iron, jacketed with 150-pound hydraulic and 175-pound steam pressure in the jackets.

Fairchild Aerial Surveys, Inc.

The Fairchild Aerial Camera Corporation, 136 West 52nd Street, New York City, has announced that its aerial survey business has grown to such an extent that a subsidiary corporation has been formed to more effectively expand this branch of the business. The new corporation will be known as Fairchild Aerial Surveys, Inc.

Another subsidiary corporation has been formed to own and operate the aeroplanes formerly owned by the Fairchild Aerial Camera Corporation and will direct operations involving contracts for flying of every description. This new corporation will be known as the Fairchild Flying Corporation.

The Fairchild Aerial Camera Corporation will continue to manufacture cameras, instruments and aeronautical equipment and will continue as the controlling corporation to finance and manage the new subsidiaries above mentioned in addition to the Fairchild Aerial Surveys (of Canada) Ltd.

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Property values advanced from fifty to one thousand dollars a foot on completion of this installation..

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A SECTION OF THE TEST GROUNDS OF THE GENERAL MOTORS TRUCK COMPANY, SHOWING GRAVEL ROAD AT RIGHT

Extensive Testing Ground for Motor Trucks

A GMC 2½-ton truck is to be kept constantly at work maintaining the 6 miles of gravel testing road on the new General Motors proving ground, according to a recent announcement of the General Motors Truck Company, Pontiac, Mich. This new proving ground, which is centrally located between Lansing, Pontiac, Detroit and Flint, where the main automobile and truck factories of General Motors are situated, contains 1,125 acres of land and more than 8 miles of gravel and concrete highways which are used for proving General Motors machines under actual operating conditions.

The GMC truck which has just been put in operation is equipped with a scraper and other road machinery for work during the summer and will operate a snow-plow to keep the testing grounds clear throughout the winter.

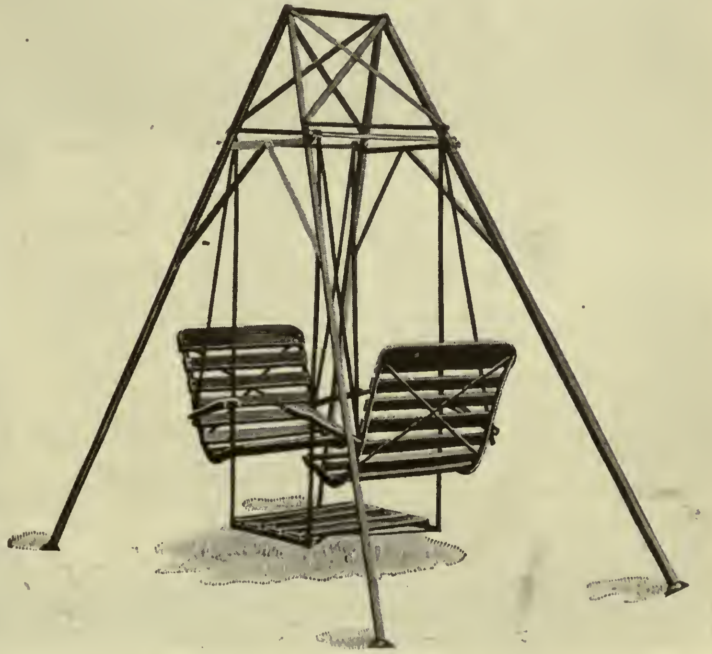
A New Park Swing of Heavier Construction

A new swing which is of somewhat heavier construction than is customary and which is designed to meet the requirements of parks and playgrounds, has recently been produced by the Bausman Manufacturing Company, Millersville, Pa. The basic principles of construction follow those found in the original Bausman steel swing, which has been in use for more than a quarter of a century. Heavier construction throughout, however, provides the sturdiness required in public parks, playgrounds and recreation centers. The swing is shipped in two sections which are easily joined together, thus erecting a substantial piece of equipment. All of the metal parts are finished with green enamel, and the wood is natural, with two coats of weather-proof varnish. The main frame is made up of 1½ x 1½ x 3/16-inch steel angles, the suspension frame of 1½ x ¼-inch flat steel, and the seat is 30 inches wide.

Van Gorder Succeeds Reagan

The Neptune Meter Company, 50 East 42nd Street, New York City, has announced the appointment of J. R. Van Gorder, formerly New York representative, as Eastern Sales Manager. Mr. Van Gorder takes the place of the late John F. Reagen, Jr., well known in this position and as the late President of the American Water Works Manufacturers Association, which manages the exhibits at the water-works conventions.

Mr. Reagan was formerly with the Consolidated Water Company of Utica. He entered the office of that company as clerk in 1900, and rose rapidly to the general managership. In 1910 he left the water company and became associated with the Neptune Meter Company of New York City.. In April, 1920, he was made Eastern Sales Manager, and he held this position at the time of his death. and he held this position up to the time of his death.



A STURDY SWING FOR PUBLIC PARKS

Grand Boulevard, Chicago,

five hundred concrete lighting standards installed by the South Park System to beautify and reduce maintenance cost.

Post Designed and Manufactured by

CHICAGO CONCRETE POST CO.

Lawrence, Lamon and Leland Avenues
CHICAGO, ILL.

STANDARD POROUS PLATE PASSING 40.5 CUBIC FEET OF AIR PER MINUTE

Porous Plates for Sanitary Works

A thorough study of the conditions to be met and the requirements of sanitary engineers engaged in the treatment of sewage by the activated sludge process, has resulted in the production, by the Research Department of the Norton Company, Worcester, Mass., of a uniformly porous, acid-proof air-diffusing medium and filter plate of considerable strength. These Norton porous plates are composed of electrically fused alumina grains, bonded together in the kiln with an aluminous glass. This ware is practically unaffected by acids, or neutral and slightly alkaline liquors, according to the manufacturers, and is therefore well adapted to sewage work. .

Examinations of the structure of these porous plates with microscopes show their homogeneous composition. All grains are angular and are joined together at the point of contact with an aluminous glass bond, each grain being covered by a vitreous coating. The plates are made in three standard grades—coarse, medium and fine. The coarse grade plate contains comparatively large pores uniformly distributed over the entire area of the plate and offers the least resistance to the passage of gases or liquids. The medium grade has pores smaller than the coarse grade, but, as in all the plates, pore distribution is uniform throughout the entire plate. This grade is used for diffusing air, as in the activated sludge process of sewage treatment and for diffusing various gases when rapid aeration, agitation or absorption is desired. The fine grade contains the largest number of pores, but they are of smaller size and are also uniformly distributed. This grade is used for diffusing air and gases in small streams of minute bubbles.

The porous plates are made 12 x 12 x 1 inch, as this size has been found most suitable for installations. When air starts up through a water-saturated plate it must first lift practically all of the water in the plate to its surface before any of the air escapes through the plates. This means that the initial resistance of a water-saturated plate to the passage of air is greatest at the start.

Norton porous plates are furnished for both the ridge and furrow and the Manchester types of activating plants for sewage treatment, as well as for any modifications of these types. Since thorough control is maintained over the grain size, the plates can be supplied at various porosities, but in each and every case pores are uniformly distributed through the entire body of the plate. A foot-square plate with fine pores contains a larger number of pores than the same size plate containing large pores. The accompanying illustrations show two standard-size, 12 x 12 x 1-inch plates passing 4.4 cubic feet of air per minute and 40.5 cubic feet per minute respectively.

Union Water Meter Company Opens New York Office

The Union Water Meter Company, Worcester, Mass., has opened a New York office at 452 Hudson Terminal Building, 50 Church Street, New York City. Edward W. Jacobs, for the past ten years representative of this company in the New York territory, will be in charge. The Union Water Meter Company was organized in 1868 and manufacturers water-meters of several types.

POROUS PLATE PASSING 4.4 CUBIC FEET OF AIR PER MINUTE

Champion Snow Plow

Can You Afford to be without a Champion Snow Plow?

Not when indisputable evidence shows that it will save its cost after one big snow storm.

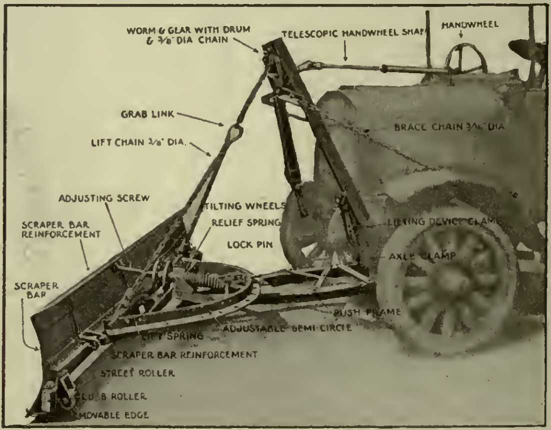
Keeps the wheels of traffic turning by moving snow quickly and economically from city streets or country roads

Champion Snow Plow attached to a White Truck
—can be quickly attached to any standard truck

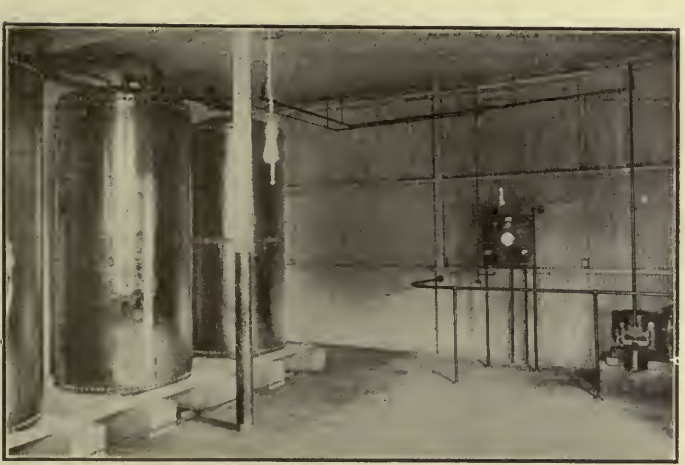
Showing details of construction of Champion Snow Plow

Ask for Snow Plow Catalog

The GOOD ROADS MACHINERY CO.
KENNETT SQUARE, PA.
NEW YORK, N.Y.:—50 Church Street
WATERTOWN, MASS.:—36 Pleasant St.
CHICAGO, ILL.:—49th and Halstead Sts.
PITTSBURGH, PA.:—1523 Oliver Bldg.



Champion Snow Plow



MIDDLETOWN, CONN., AIR WHISTLE INSTALLATION
The air tanks are shown at the left, the control board at right center, and the motor compressor at the extreme right

Recent Fire-Alarm Improvements

The great increase in the practice of factories buying their power from an outside source instead of maintaining a steam pressure is resulting in fewer steam fire whistles and in the installation of a very considerable number of diaphones and air whistles made by the Gamewell Co., Newton Upper Falls, Mass. Lyons, N. Y., has recently installed a diaphone, and with it a number of boxes, a transmitter and switchboard. Woodland, Calif., has installed a new diaphone and a number of boxes and overhauled all of its existing line construction. Middletown, Conn., where they desire to obtain the use of a whistle, has installed compressed air tanks for the operation of the whistle.

The next three months will be the most dangerous in the year for schoolhouse fires, and to meet this condition, Needham, Mass., has installed in its new high school a complete fire-alarm system which is connected directly to the city circuit.

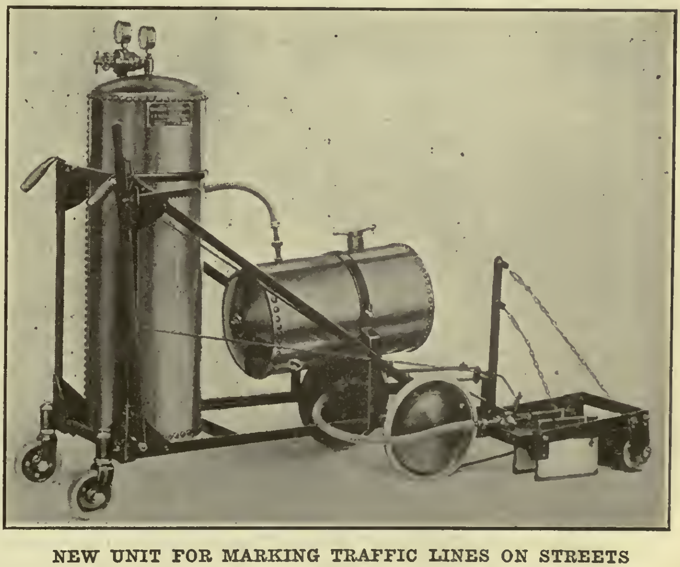
Levison Heads Blaw-Knox Road-Building Department

The Blaw-Knox Company, Pittsburgh, Pa., has announced the appointment of Arthur Levison, Highway Engineer, U. S. Bureau of Public Roads, as chief engineer of the road-building department of the company. Mr. Levison has been successively Inspector of Road Construction of the New York State Highway Department; Assistant Engineer of Barge Canal Construction, New York State; Assistant Engineer, Subway Construction in New York City; Engineer in Charge of Reinforced Concrete Building Construction at the Washington Navy Yard, and since 1919 has been connected with the U. S. Bureau of Public Roads in the capacity of Highway Engineer, cooperating with highway departments of the Middle West in the design, construction and maintenance of all types of highway improvements. His most recent work has been in connection with conducting a research on concrete pavement construction. In his new position with the Blaw-Knox Company he will assist in improving the design of its road-building equipment, cooperating with engineers and contractors to make it possible to build better roads more economically and to develop new apparatus for road work.

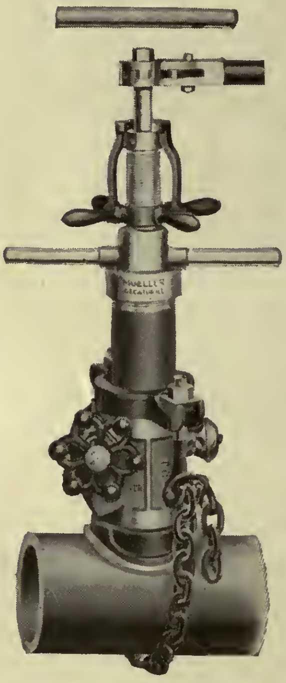
Painting Traffic Lines by Machine

A new device for the rapid painting of the lines required for the regulation of vehicle and pedestrian traffic on roads has been brought out under the name "Ault Traffic Line Marking Machine" by the Tennessee Tool Works, Inc., Knoxville, Tenn. This machine lays an average of 200 lineal feet per minute, 3 to 8 inches wide, giving a uniform and distinct line, either curved or straight, and is operated by one man. The machine weighs only 160 pounds. The entire device is mounted on roller bearings, is rubber-tired and has disc steel wheels. Compressed air forces the marking material between specially designed shields and wiper brushes, and all surfaces to be painted are cleaned in advance by a revolving brush.

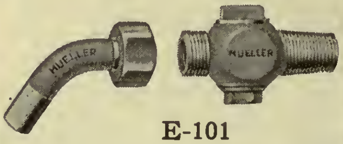
Actual tests indicate that one machine will do the equivalent of the work of twelve to fifteen painters using a hand brush, and it also permits the use of quick-drying paints. The machine practically dispenses with the need of night painting. Extra attachments are provided for spraying fire-plugs, posts, guard-rails, underpasses, etc., and also the direct spraying of letters, arrows, etc., on stencils. The air supply is obtained from a service station once each day.



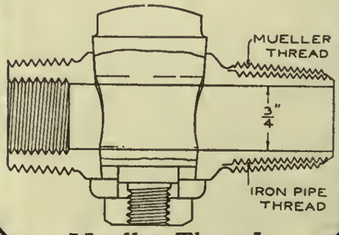
NEW UNIT FOR MARKING TRAFFIC LINES ON STREETS



"B" Tapping Machine



E-101



Mueller Thread

Good Tools Proclaim the Good Artisan

"I can always tell a good workman by the tools he uses," wrote a well-known sanitary engineer, recently.

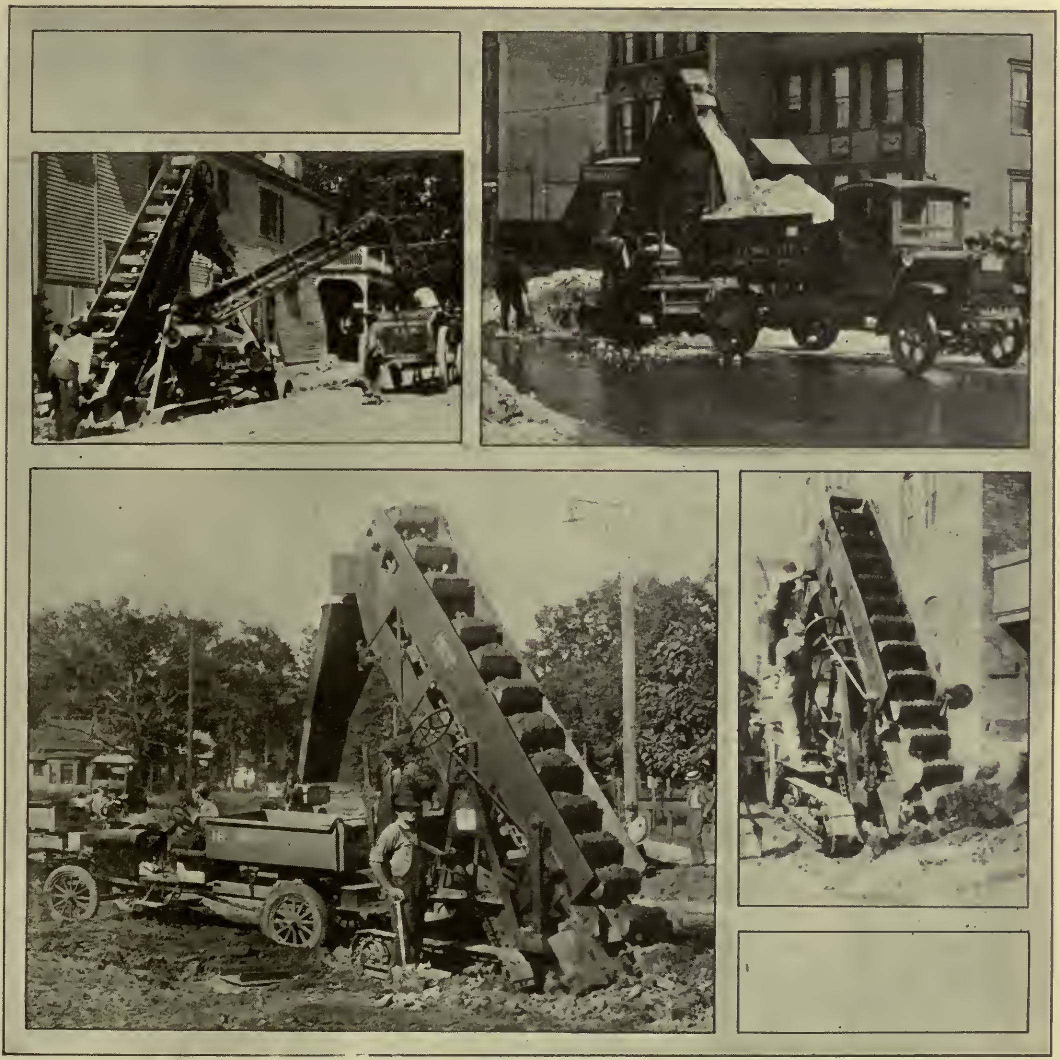
He meant to infer that good work can be done only with good tools and that the careful artisan would not use old style or worn tools.

Nowhere is this more apparent than with a tapping machine. A worn machine cannot do a satisfactory job.

Even if your tapping machine is a very old one, you can get a big allowance on it by turning it in on a new Mueller machine, which will make taps one-half to one inch and insert corporation taps in mains under pressure.

This proposition enables you to have a new Mueller tapping machine on a very small investment. Let us give you full particulars of our "trade in" plan.

MUELLER CO.
DECATUR, ILL.
New York San Francisco Los Angeles
Jobbers in all Principal Cities



VARIOUS USES OF HAISS WAGON LOADERS, AS DESCRIBED IN TEXT

Creeper Loaders in Municipal Work

The accompanying illustrations show the use of Haiss creeper wagon and truck loaders in various types of municipal work, and portray the variety of legitimate services which these machines can render.

Frenzel Brothers Company, Chicago, Ill., use two Haiss creeper loaders for excavating alleys for paving. The material handled is sand, ashes and soil, generally spoil from adjacent cellar excavations. The alleys are loosened with a rooter plow, which shows up any rocks that need individual attention, and also culverts, ducts and other pipes. The loader goes along the middle of the alley, which may be from 9 to 16 feet wide, and laborers throw the material from the sides into the path of the feeding propellers. Trucks of 4 and 6 yards capacity back under the loader to receive the material, and drive out. In one period of 28 minutes total elapsed time, 40 yards were placed in trucks, with one loader.

Rogers & Monroe, Muskegon, Mich., use a creeper loader for excavating streets. The soil is principally sand, and unless there is an old macadam surfacing, the street is not even scarified or plowed. The force used to operate the loader consists of the operator, the grading foreman, and one laborer. The material is loaded into 1¼-yard Ford trucks, running alongside the loader. The average output for the summer of 1924 was 290 cubic yards per day, measured in excavation. The average gasoline consumption was 15 gallons per day. Between 15 and 18 trucks were used on an average haul of 1¼ miles.

New Orleans Public Service, Inc., uses a loader for removing old shell and clay ballast in track reconstruction. The operation of the machine is very satisfactory when the ballast is dry, but it is necessary to clean out the bucket and spout from time to time when the clay is damp. Even in damp material there is a saving over hand labor. The creeper loads into a separate belt conveyor which puts the material in trucks and cars. A

Release your city

SNOW BLOCKED streets are a brake on community progress. They paralyze traffic —check public and private advancement. Life and property are not safe! Ambulances and fire engines cannot reach their destinations. Fuel cannot be delivered. Prosperity wanes! Business is unsatisfactory. Buyers and employees are unable to reach shopping centers.

Snow Removal Pays For Itself

CITIES throughout the snow belt are finding that snow removal pays. The experiences of those cities which are using Best Tractors to clear snow blocked streets has proven this beyond a doubt.

Write for literature on snow removal.

C. L. Best Tractor Co.

General Offices—Factory San Leandro, California

See the Best Tractors at the Chicago Road Show in January

93-1224

Factory Branch-Warehouse
St. Louis, Missouri

SALES OFFICES

SAN FRANCISCO
127 Montgomery St.

NEW YORK CITY
50 Broad St.

BEST TRACTORS

40-yard work train has been loaded in 50 minutes working time, and in one 8-hour day 112 wagons of 2 yards capacity were loaded.

C. J. Mallet, Inc., Bronx, N. Y., uses Haiss creepers in his material yards. In February, 1924, he took one of them out for a snow-removal job, and for a week or more he put up 8-yard loads with it in 3½ minutes. The force consisted of the operator and of two shovelers to clean up outside the propellers.

New P. & H. Representatives

The Pawling & Harnischfeger Company, Milwaukee, Wis., has announced the appointment of H. L. Mode as a sales representative of the Eastern territory with headquarters at New York and Philadelphia. Mr. Mode has had ten years of experience with overhead electric traveling cranes, as well as seven years' experience in the motor department of the General Electric Company. He will specialize in problems of electric traveling cranes.

The appointment of N. P. Farrar as Assistant Sales Manager has also been announced. Mr. Farrar has been District Manager of the Philadelphia territory until recently and has had considerable experience with overhead electric traveling cranes, hoists and gasoline-powered excavators.

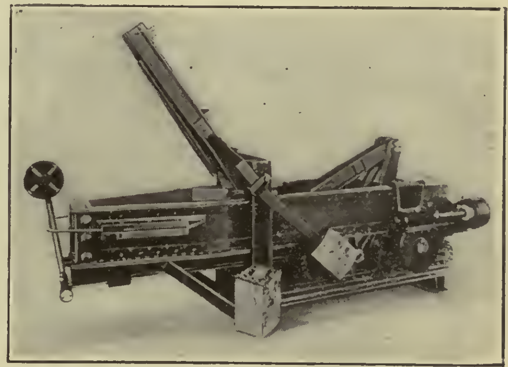
Fire Pump Mounted on Auto Running-Board

The accompanying illustration shows an Evinrude high-pressure pump mounted on the running-board of a Locomobile belonging to the Placerville, Calif., Fire Department. This outfit, which is similar to one in use at Oakdale, Calif., carries a 250-gallon tank of water and is connected with a relief valve. It is also rigged with an electrical starter which is chain-driven.

The pump unit is 31 inches long, 11½ inches wide and 17 inches high and weighs only 105 pounds. At a head of 277 feet, or through 1⅓ miles of 1½-inch pipe, the pump can deliver 1,500 gallons per hour. At 120 pounds pressure it throws a 100-foot stream through a ⅜-inch nozzle. The pump is of special design, internal gear type, with extra-long bearings to insure freedom from wear or leakage. The power-plant is directly connected to the pump shaft by an Oldham coupling.

The engine is an Evinrude 4-5 horse-power, 2-cylinder, equipped with an Evinrude magneto built in the fly-wheel. The standard equipment includes, besides the magneto and starter, a float carburetor, a pressure-gage, an aluminum base with gasoline tank, and the necessary tools for adjustments which may be necessary for the engine or pump.

HIGH-PRESSURE FIRE PUMP MOUNTED ON RUNNING-BOARD OF TRUCK



STURDY BALING EQUIPMENT

Saving Money by Baling Metal Refuse in Washington

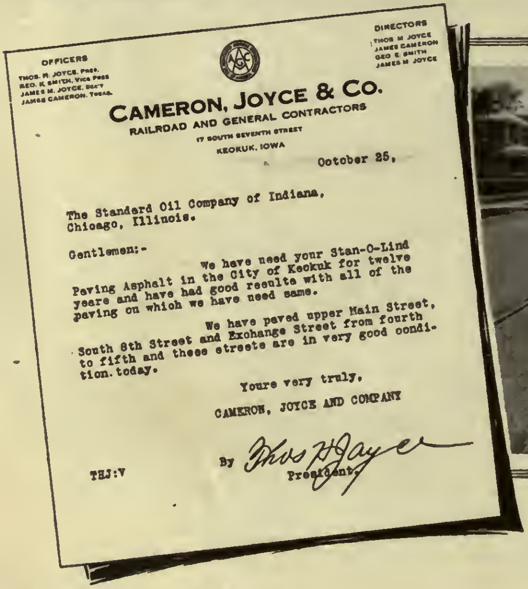
The disposal of waste tin cans and other metal refuse collected by the City Refuse Division of the District of Columbia has become a profitable undertaking through the use of the baling press illustrated herewith. This machine, which is manufactured by the Economy Baler Company, of Ann Arbor, Mich., was installed in Washington, D. C., about five years ago and has given very satisfactory service since that time.

By the use of this motor-driven baler, from 200 to 300 bales of scrap metal are produced daily. These bales measure approximately 10 x 12 x 18 inches and weigh about 40 pounds each. The actual operation of the press requires the services of two men, and an average of four men daily are employed to pick out the waste tin cans, etc., from the conveyor belt for feeding to the machine. During the past fiscal year a total of 3,033,060 pounds of scrap metal was compressed and baled by this method, with a resultant value of $7,888.60. The cost of labor for picking the material and the operation of the press during the year is estimated to have been in the neighborhood of $5,130.

A CORRECTION

In the article on "Results of November Election Referenda," on page 613 of this issue, the third item should be credited to the state of Missouri, instead of to Michigan as printed. The Michigan item which appears sixth in the compilation is correct.

KEOKUK STREETS STAND TEST *of* TIME



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RAILROAD AND GENERAL CONTRACTORS
17 SOUTH SEVENTH STREET
KEOKUK, IOWA

October 25,

The Standard Oil Company of Indiana,
Chicago, Illinois.

Gentlemen:-

We have used your Stan-O-Lind Paving Asphalt in the City of Keokuk for twelve years and have had good results with all of the paving on which we have used same.

We have paved upper Main Street, South 8th Street and Exchange Street from fourth to fifth and these streets are in very good condition today.

Yours very truly,

CAMERON, JOYCE AND COMPANY

By Thos H Joyce
President.

THJ:V

Scene on Upper Main Street, Keokuk, Iowa, where Stanolind Paving Filler was applied many years ago. The filler has given excellent results on this street.

Good after Twelve Years Service

OUT in Keokuk, Iowa, Stanolind Paving Asphalt has been used for the past twelve years and in every instance it has given entire satisfaction. The picture above shows a section of Upper Main street (brick with Stanolind Asphalt Filler). This same product has given equally as satisfactory results at hundreds of other points throughout the country.

Stanolind Paving Asphalt, properly used, will give greater service and satisfaction, per dollar cost, than any other high class paving that can be used This fact has been demonstrated repeatedly

And at the time initial cost is considered, thought should also be given to the maintenance cost. In the case of Stanolind Paving Asphalt the latter is surprisingly low, as streets paved with it, in many cases, serve ten years without requiring any repairs whatever.

Ask for this free booklet

Check the record of any street constructed of Stanolind Paving Asphalt; the traffic it carries; the cost of construction and its upkeep, then compare these figures with like figures on any other type of paving. You'll see then why Stanolind Paving Asphalt has constantly grown in popularity with those who strive for the best roads. It is a plain case of dollars and sense.

If you are interested in formulating a constructive street or road building program for your town, city or county, we invite you to communicate with our staff of efficient, experienced road engineers. They will be pleased to co-operate with you and give you the benefit of their advice.

This service is rendered free of charge and it places you under no obligation whatever to us.

STANDARD OIL COMPANY
(INDIANA)
General Offices: 910 S. Michigan Ave., CHICAGO, ILLINOIS

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